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I.

HALOS OF GLAUCOMA—A DIFFRACTION PHENOMENON.*

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Glaucoma is interesting from many standpoints, but aside from its etiology, of which little is known, there is no one feature of it more interesting than the halos which are seen by some glaucomatous patients about sources of artificial light. There are two symptoms occurring in sequence which invariably precede the appearance of the halos. These signs are increase of tension and smoky cloudiness of the cornea. Without the latter no halo occurs.

Not all opacities of the cornea are associated with halos. Opacities may occur, even those peculiar to glaucoma, which to all intents and purposes are similar to opacities in which halos are apparent, and yet the latter are absent. These observations would seem to indicate a certain delicacy of refinement of structure necessary to the appearance of halos. Anatomic investigation bears out this indication; for there is a decided anatomic difference between opacities peculiar to

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parenchymatous keratitis and the variety associated with glaucoma. In the former the opacity which occurs in conjunction with halos about artificial light consists of individual droplets of exudate laid down between Bowman's membrane and the corneal epithelium, and definitely confines itself to the limits of the space bounded by these two strata. In the latter, small particles of exudate—round cells principally—accumulate in the corneal lacunæ, and have no semblance of stratification. There may be two or three such accumulations of exudate superimposed in similarly situated corneal lacunæ, or a marginal opacity superficially situated may cover the edge of a neighboring opacity situated in a deeper corneal layer. Parenchymatous opacities lack that limitation to a single geometric plane so peculiar to the glaucomatous variety.

It was stated above that not all opacities, typically glaucomatous, are capable of producing halos. The cloudiness of the cornea which occurs in this dreaded disease changes its appearance almost spontaneously. The cornea can be clear throughout the day till dusk, when it became suddenly cloudy. The suddenness with which these opacities change is further exemplied by the fact that immediately following corneal incisions the cornea returns to its normal transparency. With this change in the corneal transparency the halo phenomenon vanishes. There are glaucomatous eyes during the whole process of which the opacities have not been favorable at any time to the halo phenomenon.

In summary of the facts that are found upon clinical investigation, before taking up experimental evidence, it may be said: Parenchymatous opacities are not associated with halos. Parenchymatous opacities are not situated in the same geometric plane of the cornea, but are situated throughout its stromal layers. Some are situated well forward, others are quite deep; and all have a denser structure than glaucomatous opacities. Glaucomatous opacities occupy a particular geometric plane of the cornea, and are situated exclusively within the confines of that plane. Glaucomatous opacities are capable of undergoing rapid fluctuation of density; not all glaucomatous opacities are associated with halos; and in the case of the same opacity, there are periods when the halo disappears and reappears without any macroscopic change of structure in the opacity. It is the purpose of this paper to produce by laboratory means halos similar to those obtained in glaucoma; to show that these halos are caused by certain corneal opacities which latter conform to a standard of structural regularity and dimensions determinable in the physical laboratory.

A perfectly normal cornea previously holocained to insensitiveness, and bared of its lid coverings by retractors, was covered with bolting silks of increasing fineness. The finest silk obtainable contained 36,864 mesh to the square inch, which gave an opening of 1/192 of an inch. Through such a silk the filament of an artificial source of light appeared to the patient as multiple (there were several filaments); but there was nothing even faintly suggestive of color or halo. Next, two layers of the same silk superimposed upon one another so that the strands of one reduced the caliber of the mesh in the other, were laid upon the cornea. There followed further increase in the number of lamp filaments, and the patient explained it as similar to looking through a frosted glass held very close to the eye. There was no color. Next, lycopodium powder was dusted onto the cornea and the excess blown off. After much difficulty a layer of powder was obtained on the cornea which gave a result which the patient described as follows: There is a great splash of red, a smaller splash of blue-green, and a lighter colored spot in the center. All outline of the filament had vanished. The patient could not call these splashes rings. The color was unquestionable, but the form vague.

Much difficulty was encountered in getting the thickness of the lycopodium that gave this result. When the powder was first applied the layer was very thick, and the excess had to be blown off before the patient was able to discern the lamp except as a glow. In the attempts to blow off the excess, too much was frequently cleared away, leaving a thin layer. Through this the patient discerned vaguely the coils of the lamp filament. When the lycopodium was applied either too thickly or too thinly, there was no color apparent. Thus, both in the case of opacities peculiar to glaucoma halos and the variety experimentally produced here, there is apparently necessary a certain refinement of structure and dimension prerequisite to the formation of halos.

The phenomenon of halo production is obtainable in the physics laboratory, and can be studied there to better advantage. Also, the optical instrument affords this advantage over the human eye—namely, that it is devoid of all sensation and will not irritate under the tedious handling necessary. Hence we are forced, in the investigation of this phenomenon, to depend upon information obtained from optical instruments; and then from the points of identity their employment bears to the findings in glaucoma, we are justified in calling the two processes the same.

FIGURE 1.

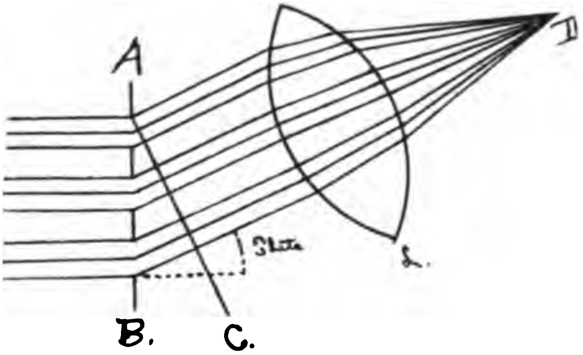
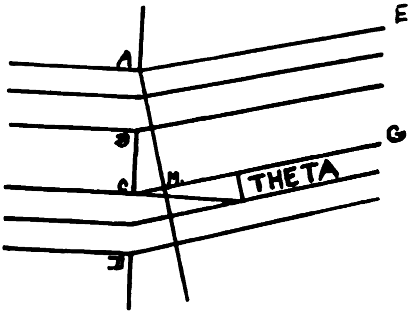


FIGURE 2.



Halos can be produced in several ways, but there is one method that bears a particularly intimate relation to the glaucomatous variety. It is dependent upon the use of a grating through which the light is passed as it comes from a small distant source, and is then focused by a convex lens upon a screen situated at the focal distance from the lens.

Let A, B be a plane grating through and upon which a train of plane monochromatic waves play normally. Such a relation of grating and light produces a bending of the latter at an imaginary angle, Theta, with the grating normal. If these parallel rays play upon a converging lens situated as in the diagram, they are brought to a focus at the principal focus, D, of the lens. This illumination of the point D is the resultant of all the disturbances of the various rays. Draw A, C perpendicular to the direction of the waves; then any plane wave the section of which coincides with A, C will not suffer any phase change after passing A, C. However, before reaching A, C, the waves have traversed different paths, and as the phase of the waves in the plane of the grating is similar, any change of phase is due to the difference in the paths traversed.

In Figure 2, A, B, and C, D are equal grating spaces separated by B, C. A, M is perpendicular to the direction of the waves, and the latter make an angle, Theta, with the grating normal.

Angle Theta in the diagram 2 is complementary to angle A, C, M. Triangle A, M, C is a right angle triangle with the right angle at A, M. C. Angle C, A, M is complementary to A, C. M. Since angle Theta and angle C, A, M are both complementary to angle A, C, M, they are equal to each other. Therefore, angle C, A, M equals angle Theta. Before reaching A, M the ray C, G has traversed the distance C, M, and, on the other hand, the ray A, E has started at A. Therefore, the ray C, G is the distance C, M behind the ray A, E.

Accordingly as the waves from M are an odd or an even number of half wave lengths behind those from A, the former will interfere or reinforce the latter.

Likewise, any other rays which occupy similar positions in the grating elements adjacent, will reinforce or interfere with each other; for all similar points between the lines A, B and A, K have differences in phase proportional to C, M.

We have limited this investigation to a single pair of grating elements, whereas a plane grating is made up of many such elements, distributed uniformly over the surface, each consecutive pair of which act in relation to the elements of the pair in the manner we have diagramed above.

$$\text{Angle C. A. M.} = \text{angle Theta}$$

$$\frac{\text{A. C.}}{\text{C. M.}} = \text{Sin. Theta}$$

$$\text{C. M.} = \text{A. C.} = (a + b)\ \text{Sin. Theta}$$

Thus the point to which are focussed rays bearing homologous relation to grating elements will be brightly illuminated when $(a+b)$ Sin. Theta $= n +$ Lambda (I) in which Lambda = wave length.

On the other hand, the same point will be dark when $(a + b)$ Sin. Theta $= (n + 1/2)$ Lambda (II).

The point O in Figure 3 corresponds to a zero value for Theta, and will be a bright spot. At another place along the screen there will be a point which satisfies the conditions of theorem II. At this point there will be darkness. Again theorem I will be satisfied by a satisfactory value for Theta; and at this point on the screen there will be a corresponding bright spot. So on it goes throughout the extent of the screen, here a bright spot succeeded by a darker area.

To date, monochromatic light has been supposed in all our reasoning. For blue light, angle Theta will be less than Theta prime for red light; for

$$\text{Sin. Theta prime} = \frac{\text{Lambda}}{a + b}$$

and the smaller Lambda is, the smaller will be the value of Theta necessary to satisfy the equation. The fact that Theta in the case of blue light is smaller than in the case of red, explains the constancy of the blue spectrum inside the red. When white light is used, the blue and the red are thus dispersed through the influence of diffraction, and there results for each pair of grating elements a blue spot lining a larger red one. When the grating elements are numerous enough, the red spots and blue spots overlap one another to form complete rings.

At this stage of our investigation the question naturally presents itself: Why does light passing through the various apertures of a grating undergo interference and intensification so as to form halos? For an explanation of this, resort must be had to a diagram explanatory of the coordinate effect of half wave lengths upon one another in their illumination of an object.

Let S, Figure 3, be the section of a narrow slit perpendicular to the plane of the paper. Light passing through S will be cylindrical wave fronts which pass through A, B. Let O be the point whose illumination it is our intention to determine. Illumination at point O is due to the combined action of the wavelets formed at different points in the surface A, P, B, because O

FIGURE 3.

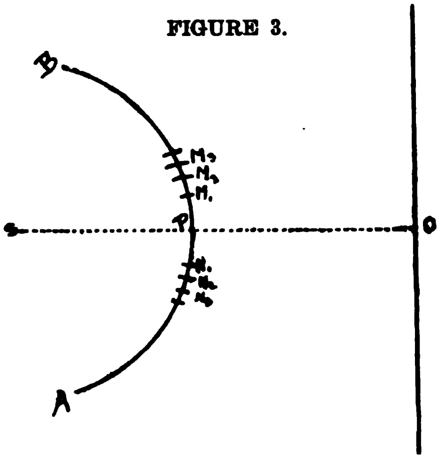
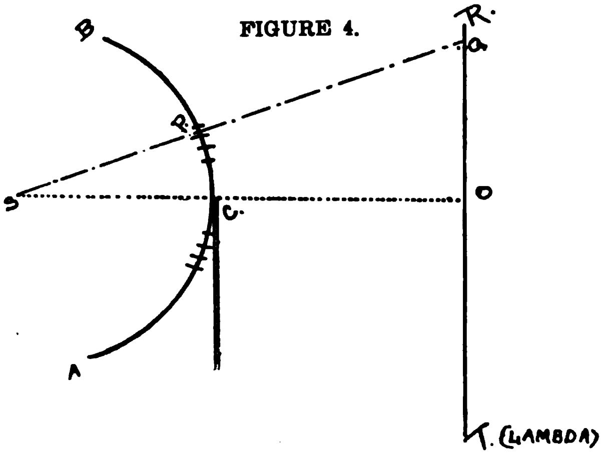


FIGURE 4.



is illuminated only by light from S, and all the light from S passes through the plane A, P, B. As all the points in A, P, B are different distances from O, the light from the different points must have started at different times. Let Lambda be the wave length of the light which passes through S, with O as a center $\left(O, P + \frac{\text{Lambda}}{2}\right)$ as a radius strike arcs M_1, N_1. Thus the points M_1 and N_1 are one-half wave length farther from O than P is, and in order for the light from M_1 or N_1 to reach O simultaneously with light from P, the former must have started one-half wave length earlier. With a radius equal to P, O + Lambda and O as a center, strike points M_2, N_2 on A, P, B; also with a radius equal P, O + $\frac{3 \text{ Lambda}}{2}$ strike points M_3, N_3. Then each point is one-half wave length farther from O than its predecessor, and light from that point must have started one-half wave length earlier than the light from the preceding point in order to get to O at the same time. The breadth P, M_1 is greater than M_1, M_2; M_2, $M_3 >$ M_1, M_2, and so on it is with the points below P. The breadths between the points are in descending order of magnitude. As the elements are all of equal length, the amount of light admitted between consecutive points varies directly with the magnitude of the breadths; and these latter are in descending order of magnitude. Therefore, the illumination is in descending order of magnitude. Since the rate of decrease in the area of the elements is a continuous one, the area of any element is the mean of the preceding and succeeding ones. Consequently, the illumination at the point O from any one element is equal to one-half the sum of the illumination from the preceding and succeeding elements.

Let d_1, d_2, d_3............ be the numerical values of light from PM_1, M_1M_2, M_2M_3............respectively. Then indicating the phase difference between odd and even elements by prefixing a minus sign to the even, we find that displacement D due to the half P, B of the wave surface, is equal to

$$D. = d_1 - d_2 + d_3 - d_4 \ldots\ldots\ldots\ldots$$

$$= \frac{d_1}{2} + \left[\frac{d_1 + d_3}{2} - d_2\right] + \frac{d_3}{2} + \left[\frac{d_3 + d_5}{2} - d_4\right] = \frac{d_1}{2}$$

The light from the various points M_1, M_2, M_3............ behaves differently when the light from the points N_1, N_2, N_3............ is intercepted by a scale, C, placed between S and O. We may determine the difference of behavior as follows: The straight edge C and the plane R, O, T in diagram Figure 4 are parallel to each other and perpendicular to the paper. The circle A, P, B corresponds to the similar circle in the preceding diagram. At O the illumination is due to the half period elements which arise from the uncovered part of the circle A, B, and the displacement is equal to $\frac{d_1}{2}$ as shown above. As we pass along O, T into the geometrical shadow, the first, then the second and third half period elements from the shaded half of the wave circle are cut off.

When the first half period element is cut off, the displacement at O is given by

$$D. = -d_2 + d_3 - d_4 \ldots\ldots\ldots\ldots$$

$$= -\frac{d_2}{2}\left[\left(\frac{d_2 + d_4}{2}\right) + d_3\right] - \left[\left(\frac{d_4 + d_6}{2}\right) + d_5\right] \ldots\ldots\ldots\ldots$$

$$= -\frac{d_2}{2}$$

When the second half period element is cut off, the displacement is given by

$$= d_3 - d_4 + d_5 \ldots\ldots\ldots\ldots$$

$$= \frac{d_3}{2} + \left[\left(\frac{d_3 + d_5}{2}\right) - d_4\right]$$

$$= \frac{d_3}{2}$$

When the third half period element is cut off the displacement is equal to $-\frac{d_4}{2}$, and so on for all subsequent half period elements.

As d_1, d_2, d_3, d_4............ are in descending order of magnitude, the displacement rapidly diminishes as we proceed into the geometrical shadow; and the illumination which is proportional to the square of the displacement diminishes more quickly.

Hence, there is some illumination in the limits of the geometrical shadow.

As we travel in the direction of R from O, the previously intercepted half period elements are exposed, and the illumination at any points along the distance is due to one complete half of the wave surface B, P, together with a certain number of half period elements from the other half of the wave surface.

When the first half period of the second half wave surface is exposed the displacement $D_2 = \frac{d_1}{2} + d_1 = \frac{3d_1}{2}$

When the first and second half periods are exposed:—

$$D_3 = \frac{d_1}{2} + d_1 - d_2 = \frac{d_1}{2} \text{ (nearly)}$$

When the first, second and third half periods are exposed:—

$$D_4 = \frac{d_1}{2} + d_1 - d_2 + d_3$$

$$= d_1 + \left[\left(\frac{d_1}{2} + \frac{d_3}{2}\right) - d_2\right] + \frac{d_3}{2} = d_1 + \frac{d_3}{2}$$

As the illumination varies directly as the square of the displacement, the illumination corresponding to $D_2 = \frac{9d_1^2}{4} = 2.25d_1^2$, that of $D_3 = \frac{d_1^2}{4}$, $D_4 = d_1^2 + \frac{2d_1 d_3}{2} + \frac{d_3^2}{4}$ and so on. Hence, the light at any particular point between O and R is not equal to any other point.

At the particular point corresponding to D_2 the light is more intense than would be the case if the whole wave were operative. At the point corresponding to D_3 the illumination is less than that corresponding to D_2; hence, the latter will be bordered by a relatively darked band. At D_4 there will be more light than at D_3, so the latter will be bordered by a bright line. And so on until the illumination is too faint for discernment.

In the case of a grating, there are many intercepting screens, each of which produces in the light the same changes we have diagramed above; and when white light is used the red element will be more markedly affected than the blue.

Halos have varying stages of completeness, depending upon the gratings which cause them. The best halos are obtained through a grating containing apertures from one to four half wave lengths for blue light. When it is realized that waves of blue light are in the neighborhood of 1/50,000 of an inch, some idea is gained of the fineness of the rulings. The finest gratings contain from 20,000 to 40,000 rulings to the square inch. Not fineness of ruling alone makes an efficient grating. A grating of the fineness given above loses much of its efficiency if the opaque elements which comprise it occupy different planes, or the opaque spaces are much larger than the transparent.

Similarly in the case of the cornea, not all opacities are arranged in a manner that will produce grating effects. In parenchymatous opacities the individual deposits are too scattered as to situation; also they do not occupy the same corneal plane. The opacities found in glaucoma comply better with the conditions of the grating, in that they are situated quite definitely in a single stratum of the cornea. The only reason that such opacities do not cause halos more generally is that the aggregate opacity is too dense or too thin. The wave lengths of all light is shortened somewhat in the substance of the cornea, inasmuch as the latter has a much higher density than air. Hence, a grating of 20,000 rulings, capable of producing perfect halos in a rare medium, would be quite imperfect within a denser medium like the cornea; the conditions necessary for halo production which are difficult of formation even in a physical laboratory are doubly hard of production in the case of the human eye.

In the case of the bolting silk, our failure to get anything but the crudest sort of diffractive change is due to the fact that the opening of the mesh does not comply to the one to four half wave length minimum found to be necessary in the case of plane gratings. In only one respect does the bolting silk meet these requirements—namely, that the transparent and opaque area all occupy the same plane. With respect to the relative size of opaque and transparent elements, there is a decided discrepancy. In the best gratings these elements are of equal size; and in the case of the bolting silk, the ratio of transparent to opaque is easily two to one.

Likewise, with the use of lycopodium, our success or failure depends directly upon the nearness with which we can approach the exactitude of the model plane grating. Individual grains of lycopodium are roughly 1/10,000 of an inch in diameter. At least three lycopodium grains will, when laid against one another so that they do not overlap, just fill one of the small squares of a Turk's hemocytometer. These squares are 1/400 of a square millimeter, which is equivalent to 1/10,000 of a square inch. This measurement is somewhat less than it should be—at least less than the minimum. Of course, not all of this space is occupied by opaque areas; some of it is taken up with transparent areas. It is evident that if the opaque and transparent areas were equally represented, the space occupied by each would be 1/20,000 of an inch which is the lower limit of the model plane grating. However, such a ratio of balance does not exist between the grains and interspaces. Only an approach to such a ratio can be obtained by gradually reducing the thickness of the lycopodium on the cornea. The halos then obtained are only crudely suggestive of that brilliant variety secured with the perfected plane grating, because our ratio of opaque to transparent elements does not comply accurately with the plane grating standard.

II.

THE CAUSAL RELATIONSHIP OF DEFORMITIES AND DISEASES OF THE NOSE AND THROAT TO DISEASES OF THE EYE, WITH SPECIAL REFERENCE TO ASTHENOPIA.*

FRED STAUFFER, M. D.,

SALT LAKE CITY.

It is not my purpose to attempt an exhaustive review of the literature on this subject, nor shall I presume to fully explain the modus operandi by which diseases in the eye so frequently result from focal infections and deformities in the nose and throat.

My reasons for selecting this subject are because of the great importance which I believe attaches to it, and particularly because of the paucity of literature referring to it, even in the most recent textbooks.

I believe that the profession in general will corroborate my experience, in that all of the following named eye diseases are frequently caused by focal infections from the nose and throat, viz.: phlyctenular keratitis and conjunctivitis, sclerosing and interstitial keratitis, scleritis and episcleritis, iritis, uveitis, choroiditis and retrobulbar neuritis, and last, but not least, "reflex asthenopia."

My observations have led me to believe that these conditions are brought about through the operation of one or more of the following causes: First, by metastasis of disease germs from the infected foci. Second, by absorption into the general circulation of bacterial toxins; and, third, through disturbance of the vasomotor balance, either by mechanical reflex irritation from nasal deformities or from toxic action of bacterial poison. It is a well known fact that rheumatism is frequently, if not always, caused from absorption into the general circulation of bacterial toxins or pathogenic germs themselves, which are generated in diseased foci, such as tonsil crypts, ethmoidal and sphenoidal sinuses, diseased tooth root cavities, etc.

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*Read at the Second Colorado Ophthalmological Congress, held at Denver, Colorado, August 1 and 2, 1916.

Iritis and uveitis are so frequently associated with rheumatism that the question naturally arises, whether these eye diseases are secondary to rheumatism or whether they are brought about by the same causes which produce rheumatism. If what is commonly known as rheumatic iritis occurs only after the rheumatic condition is well established in the system, then we may properly conclude that rheumatic iritis is an entity depending upon some metabolic changes which occur in rheumatism itself. If, on the other hand, we can demonstrate that the socalled rheumatic iritis frequently occurs independent of rheumatism, or as a forerunner to it, in subjects with infected foci in the nose and throat, then we may conclude that rheumatic iritis is a toxic or bacterial disease caused by the same infections that produce rheumatism under favorable conditions.

According to my experience, the latter is the logical view to take. I have numerous records of cases of iritis and iridocyclitis in which rheumatism and lues can be excluded as causative factors; in which no other cause could be found than focal infections in the nose and throat. The same can be said with equal certainty of many cases of choroiditis, scleritis, and interstitial keratitis. So often have I found nasal infections a causative factor in eye diseases, that I now make a routine practice of carefully scrutinizing the tonsil, nasal passages and mouth in all obscure affections of the eye or optic nerve. In this connection the ethmoidal and sphenoidal sinuses receive special attention.

My conclusions, from studying the clinical symptoms, without special bacterial research, are that many of the diseases which in times past have been attributed to lues and other constitutional causes, result from focal infections in the nose and throat, and that the pathologic conditions are most frequently due to toxins carried into the eye through the general circulation and to the accompanying vasomotor disturbances referable to reflex irritations from deformities in the nose. I observe that there are many cases of long continued focal infections in the nose and throat which never cause eye disease; and, on the other hand, there are numerous cases with long continued pressure in the nose from nasal deformities, which do not cause eye disease. I am convinced that the greater number of these chronic inflammations in the structures of the eye occur in those patients who have focal infections in the nose or throat and at the same time have reflex vasomotor disturbances resulting from pressure on the sensory nerves from deformities in the nose.

While it is usually a combination of both of these conditions that causes the eye diseases under discussion, it is quite possible for either of these conditions alone to produce them.

Because of the anatomic relationship of the posterior ethmoidal cells and sphenoidal sinuses to the optic nerve in its passage into the orbit, there are many cases of retrobulbar neuritis caused from direct extension of disease from suppurating ethmoidal and sphenoidal cells. In my practice I have had many such cases, one of which I shall report later in this paper. That there are not more recorded cases of this kind is the thing that surprises the rhinologist who sees so many cases of destructive ethmoidal and sphenoidal sinus disease.

The condition to which I wish to call particular attention in this paper is that of "reflex asthenopia" with its train of symptoms which so frequently tax to the utmost the wits and energy of the oculist.

Who among us has not been baffled and exasperated with numerous patients suffering from more or less constant pain in the eyes and head, which is increased with the slightest effort at accommodation or on exposure to even moderate light, and who have gone from optician to oculist and from one oculist to another for relief, each prescribing glasses of negligible strength differing slightly from the one before, and still the symptoms persist.

This, in brief, is the history of the average case of asthenopia which is caused from reflex vasomotor disturbance resulting from more or less constant pressure upon the mucosa in the ethmoidal region.

The explanation of this reflex asthenopia must be sought for in the vasomotor nerve supply to this region.

It matters not whether the normal tone of the vasoconstrictor nerves which supply the capillaries in the eye is disturbed by a reflex stimulation of the vasodilators or through an inhibitory action on the vasoconstrictor fibers themselves, the fact remains, that any irritation of the sensory fibers of the fifth nerve distributed to the mucosa of the nose, especially those in the upper half of the cavities, causes a dilatation of the capillaries in the eye. To demonstrate this fact one needs only to try the simple experiment of touching any part of the nasal mucosa with a wad of cotton or a probe and note the immediate congestion of the capillaries in the conjunctiva, and at the same time the profuse flow of tears. Long continued mechanical pressure in the nose produces a chronic congestion of the capillaries in the eye, and as a result produces disturbance in the nutritive processes; and the pressure of the sluggish blood stream upon the end organs of the sensory nerves of the eye plays an important part in the symptomatology of this disease. It is worthy of notice that many of these cases have but slight errors of refraction, or none at all. All the symptoms are usually exaggerated, however, in cases where there is accommodative strain due to errors of refraction accompanying the condition of reflex asthenopia. It is in this latter class of cases that the doctor's hopes are often blasted. A patient comes with symptoms of eye strain, and upon careful examination we discover that there is a marked error of refraction or perhaps muscular imbalance, and we naturally conclude that in these errors lies the cause of the asthenopia. With an assurance of faith, we correct the ocular defects with glasses, or perhaps with an operation on the imbalanced muscles, and we tell the patient that his troubles will vanish with the remedies which have been directed to the eyes, and to the extent which these errors have contributed to the asthenopia, our predictions come true. The improvement from correcting the ocular defects is often so marked that both patient and doctor believe that the cure will be complete. But upon efforts at using the eyes for near work the symptoms return, and we again test the refraction and the muscles, and finding them properly corrected, we assure the patient that with generous diet, fresh air and remedies directed to general health, his eyes will regain their normal tone in due time.

During this time of "watchful waiting" the patient becomes impatient, and he hears of some other oculist or optometrist who has cured a case just like his. The new man must make a change, and he gives a glass with a 0.12 D. weaker or stronger cylinder, or perchance he fogs him or gives him a pair of colored glasses of the latest fashion, because, as the optician says, "he sees too much."

These patients often become confirmed neurasthenics because of the pain which they constantly endure, and because they are incapacitated to pursue their vocations. This picture is not overdrawn, nor is it one of infrequent occurrence in the practice of the oculist. I wish to emphasize the fact that many of these cases are due to disease in the nose from pressure reflex vasomotor disturbances, and any oculist will be richly rewarded, as I have been, from careful examination into nasal conditions in all cases of asthenopia. I wish to report the following three cases to illustrate this point, viz.:

Case 1.—Miss E. N., aged twenty-two years; school teacher. Family history good. Has had headache and eyeache for several years. Usually most severe in the morning. Also exaggerated after using eyes for near work.

January 27, 1915, tested eyes under homatropin mydriasis. Corrected vision with +0.50 sphere and 1° prism base in, in each eye, for constant wear.

On September 1, 1915, patient reports that headaches continue just as before, only that now she cannot do near work at all without her glasses. Examination of eyes reveals no change in the refraction from the correction she is wearing.

Examination of nose shows nasal septum deflected to the left, with a sharp spur on apex of convexity, projecting into the posterior end of the inferior turbinal. Right middle turbinal was firmly impacted against the septum.

September 3, 1915, made a submucous resection of septum and excision of the right middle turbinal. Patient made quick recovery with immediate relief of headache and eyeache.

She reported on June 1st of this year that she had been free from former symptoms. Had noticed some discomfort at end of school term from wearing her glasses.

Upon reexamination of eyes it was found that the muscle imbalance for which prisms were prescribed had disappeared and +0.50 spheres, without the prisms, were ordered, which patient is now wearing for near work only.

Case 2.—Dr. J. L. S., dentist, aged thirty-five years. Family history good. Has suffered with frontal headaches and eyeache for eighteen years. Has had numerous oculists and opticians correct his refractive error with glasses, with only partial relief of symptoms.

On April 1st of this year I corrected his refractive error under homatropin and cocain mydriasis with +0.37 sph. +0.25 cyl. ax. 90° in each eye.

On May 8th he reported the former symptoms still persisted when attempting near work.

In the meantime patient had had an attack of tonsillitis. At this time, examination showed large submerged diseased tonsils. Nasal septum deflected to the right, causing pressure on right middle turbinal.

On May 8th submucous resection of nasal septum was made and tonsils were enucleated. Six weeks after the operation the patient reports that he has had only one slight attack of headache since the operation, and that he has been working steadily at his profession, which is at best trying to the eyes.

Case 3.—J. L. C., aged thirty years; electrical engineer. Has been under my observation for past ten years, and in the meantime he has consulted several other oculists. Has had almost continual headache and eyeache, with considerable photophobia during all these years. His symptoms came on when he first entered college. I first made careful test of his refraction under atropin ten years ago, and prescribed +1.25 sph. in each eye, his total error being +1.50. There was no astigmatism nor any imbalance of the ocular muscles.

He wore these glasses for a couple of years, with only partial relief. In the meantime, he developed some weakness of the spine in the lumbar region, for which he wore a plaster cast until the spine had recovered. When he returned to me for treatment, about one year ago, he was wearing +1.50 sph. in each eye, light shade of amethyst tinted glass, given by some other oculist, which I found to be the proper correction.

I examined nose and throat and found them in perfectly healthy condition but for a deflection of the nasal septum high up, causing pressure on the left middle turbinal. I recommended operation on the septum, to which he has not yet consented. I am fully convinced that he has asthenopia due to the constant irritation from pressure.

There has always been a deep ciliary congestion in both eyes of this patient, which I find to be the condition in nearly all of this class of patients. Visual acuity is 6/5, with or without glasses. I feel sure that if I had recognized the nasal condition and corrected it when the patient first came to me, he could have been relieved of many years of suffering.

To illustrate a type of inflammatory disease of the cornea and uvea I cite:

Case 4.—Miss B. M., aged twenty-five years; telephone operator. Residence, Portland, Ore. Came to me for treatment on November 22, 1915, with history of left eye having been inflamed and painful since early in June. Had been under care of oculist in Portland, who had treated the eye from beginning of disease, with result of gradual diminution of vision from increasing area of corneal opacity and slight turbidity of aqueous. The ophthalmometer showed a high degree of astigmatism with off axis in left eye, which I considered a contributory cause to the inflammation. Inspecton of nose and throat showed nasal septum deflected to the left, causing pressure on ethmoidal region. Tonsils were not large, but upon probing the crypts were found diseased and filled with fetid cheesy plugs. The tonsils were enucleated and septum deformity corrected. Eyes treated with atropin and high frequency current. In thirty days the inflammatory symptoms had entirely disappeared. Corneal opacities and turbidity of aqueous and vitreous had cleared up so that with a +0.50 sph. ○2.75 cyl. ax. 70°, vision in left eye had risen from finger movement to 6/15.

On June 15, 1916, patient reports that she has been able to work continuously as telephone operator since the beginning of the year.

Case 5.—M. R. T., aged forty-five years; train auditor. Habits and family history good. Has had pus discharge from nose, described as catarrh, for many years. Inspection shows thick pus in region of posterior ethmoidal and sphenoidal sinuses on right side. Right middle turbinal and ethmoidal cells badly diseased.

During the past year he has suffered with much pain in the right side of head, radiating from base of right temple to frontal and occipital and parietal regions. At times he had attacks of vertigo. In September last, he came down with an attack of vertigo, accompanied by nausea and vomiting. This attack was attributed to ptomain poisoning by his physician. He had frequent recurrences of these attacks during the past winter. Was persistently treated for nervousness and intestinal disturbance, which were still attributed to the ptomain poisoning of last September. He complained of failure of sight in his right eye to his physician and oculist. This was also ignored and attributed to his nervousness.

On May 14th of this year patient came to me for treatment with above symptoms. Examination of eyes revealed the fact that patient was totally blind in right eye, with bare perception of strong light. Ophthalmoscope showed fundus normal, excepting some paling of disc. Left eye, temporal hemianopsia; vision on nasal side normal. Vision equaled 6/7; refraction normal; fundus normal.

Rhinoscopy showed disease as described above. Diagnosis was made of right retrobulbar neuritis from direct extension of disease from sphenoidal sinus which destroyed all the fibers to the right eye and the crossed fibers to left.

Treatment consisted in the exenteration of the posterior ethmoidal cells and opening the sphenoidal sinus by removing its anterior wall. This done, the fact was revealed that the superior bony wall of the sphenoidal sinus was entirely missing; only the mucosa intervening between the sinus cavity and the dura covering it. Distinct pulsation from above could be seen. The operation on the nose and its after-treatment, and high frequency current applications daily to the temple, soon relieved the patient of the severe head pains. The pus discharge from the nose is practically stopped at this writing, and the pulsation from the roof of the sphenoidal sinus cannot be seen. There has been no improvement of the sight in either eye. The temporal hemianopsia in left eye and blindness in right eye I believe to be permanent.

I am convinced in this case that if the proper diagnosis had been made a year ago, when the pains first began, and if the proper operative treatment had been instituted, this patient would still have sight in both eyes; and, furthermore, would not have had what was diagnosed as ptomain poisoning. To my mind the symptoms which were ascribed to ptomain poison were cerebral or dural irritation from pressure of pus in the sphenoidal sinus. If time would permit I could recite numerous cases to illustrate the importance of careful investigation into conditions of the nose and throat in all cases of obscure diseases of the eye.

The causal relation of diseased tonsils and adenoids to phlyctenular conjunctivitis and keratitis is so well established that it scarcely needs mentioning here.

If in the foregoing remarks I have been able to attract the attention of those present to the great importance which attaches to these nasal and throat diseases as causative factors in many obscure eye diseases, then the purpose of this paper has been fulfilled.

III.

TESTS FOR VISUAL ACUITY.*

EDWARD JACKSON, M. D.,

DENVER.

For the subjective testing of refraction, the International Broken Ring Test is inferior to the test letters. But for testing acuteness of vision, it is distinctly better. When, however, the broken ring is arranged like test letters in successive lines of varying sizes, it has no advantage over the test letters, and some obvious disadvantages. It is when a single size of broken ring is arranged in a symmetrical card that its advantages of greater accuracy and convenience appear. So arranged it is to be used by varying the distance of the test from the person to be tested.

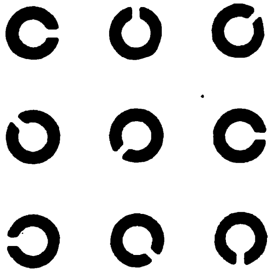

FIGURE 1.

Vision equals 1. at five meters.

A set of such test cards is here presented. On the first the broken ring is 72.5 millimeters in diameter. To see the break in the ring at five meters indicates vision of 0.1; at four meters, 0.08; at three meters, 0.06; at one-half meter, 0.01. To use this test the card is held close to the patient, the break in the ring pointed out, and he is asked to indicate its direction. When he understands fully what is expected, the card is taken to a distance, the break in the ring turned in some other direction, and the patient asked to indicate this new position. If unable to see the ring at that distance, it is brought nearer until the direction of the break is recognized. The distance, noted in half meters, gives the number of one-hundredths of vision.

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*Read at the Second Colorado Ophthalmological Congress, held at Denver, Colorado, August 1 and 2, 1916.

On the next card is a group of broken rings, each 36.2 millimeters in diameter. These, recognized at five meters, indicate vision of 0.5, or at one meter, vision of 0.1.

The third card has a group of broken rings (see Figure 1) indicating standard vision of 1. at five meters, or vision of 0.1 at one-half meter.

The fourth card has a group of rings indicating standard vision at two and one-half meters, vision of 2. at five meters, or vision of 0.2 at one-half meter.

The indications of these four tests at various distances are shown in the following table:

Distance	1st card	2nd card	3rd card	4th card
5.	.1	.5	1.	2.
4.5	.09	.45	.9	1.8
4.	.08	.4	.8	1.6
3.5	.07	.35	.7	1.4
3.	.06	.3	.6	1.2
2.5	.05	.25	.5	1.
2.	.04	.2	.4	.8
1.5	.03	.15	.3	.6
1.	.02	.1	.2	.4
0.5	.01	.05	.1	.2

To use these cards in the office, the distance of five meters should be laid off in half meters. These can be marked by tacks on the carpet or by small marks on a wall. The distance can be guessed with greater accuracy than is usually attainable when vision is tested with letters. If preferred, the card can be kept in one place and the patient moved toward it. But after each test the direction of the rings must be changed; so it is more convenient for the doctor to hold the card in his hand and move toward the person to be tested.

In doing this care must be taken to keep the light on the card comparatively uniform . The light obtained from a large window open to the sky close beside the patient will be satisfactory. If this is not available, a flash light held in the hand may be made to light the card very well.

IV.

AN INTRANASAL OPERATION FOR LACRIMAL OBSTRUCTION WITH SIMPLIFIED TECHNIC.*

HARRY L. BAUM, M. D.,

DENVER.

In presenting this subject it is not my purpose to discuss the various modes of treatment of lacrimal obstruction and its sequelæ, nor to advocate one method as preferable above others, but it is my desire to describe for your consideration a technic of my own devising which to my mind fulfills the requirements of the intranasal operation.

I shall not weary you with case reports, as many of those present have seen results that I have obtained with this technic, and others have tried it themselves, and I hope the latter will report their own results in the discussion. It suffices to say that I have been well pleased with my results in the limited number of cases that it has been my privilege to operate on, and that the final word must come from those who are interested enough to try the operation for themselves.

As a preliminary, a brief review of the anatomy of the parts concerned should not be out of place.

The lacrimal sac is the upper dilated end of the lacrimonasal duct, and rests in the lacrimal fossa. It is invested by a fibrous capsule which is attached to the margins of the lacrimal fossa and is continuous with the orbital periosteum. The lower end of the sac narrows where it passes into the nasal duct, which empties into the anterior part of the inferior meatus of the nose.

The lacrimal fossa is a depression in the lower anterior portion of the inner wall of the orbit, and is formed by the junction of the lacrimal groove of the ascending process of the superior maxillary with the corresponding groove of the lacrimal bone, the continuation downward of these grooves forming at this articulation the bony canal for the passage of the nasal duct in its course in the outer wall of the nose.

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*Read at the Second Colorado Ophthalmological Congress, held at Denver, Colorado, August 1 and 2, 1916.

The lacrimal bone forms a part of the lateral wall of the middle meatus of the nose, closing in some of the anterior ethmoid cells above and articulating posteriorly with the os planum of the ethmoid. Inferiorly it articulates with the inferior turbinate, and anteriorly with the ascending process of the superior maxillary bone.

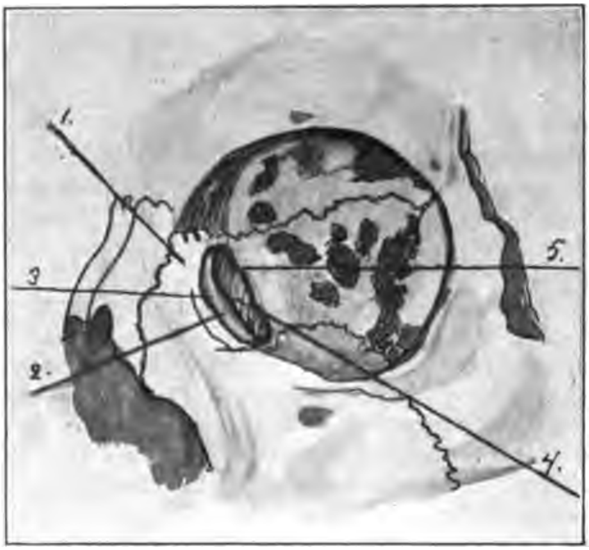

FIGURE 1.

Left orbit, showing relations of lacrimal fossa.
1—Ascending process of superior maxillary.
2—Lacrimal groove of ascending process of superior maxillary.
3—Crista lacrimalis anterior.
4—Lacrimal groove of lacrimal bone.
5—Crista lacrimalis posterior.

Thus we find interposed between the lacrimal sac and the nasal cavity the thin plate of bone which is the lacrimal groove of the lacrimal bone, corresponding usually to approximately two-thirds of the area of the sac; and a comparatively hard firm bone, the lacrimal groove of the ascending process of the superior maxillary, corresponding to approximately one-third the area of the sac. The duct is separated from the nasal cavity by a thin plate of bone formed by this articulation, with the addition of the inferior turbinal below.

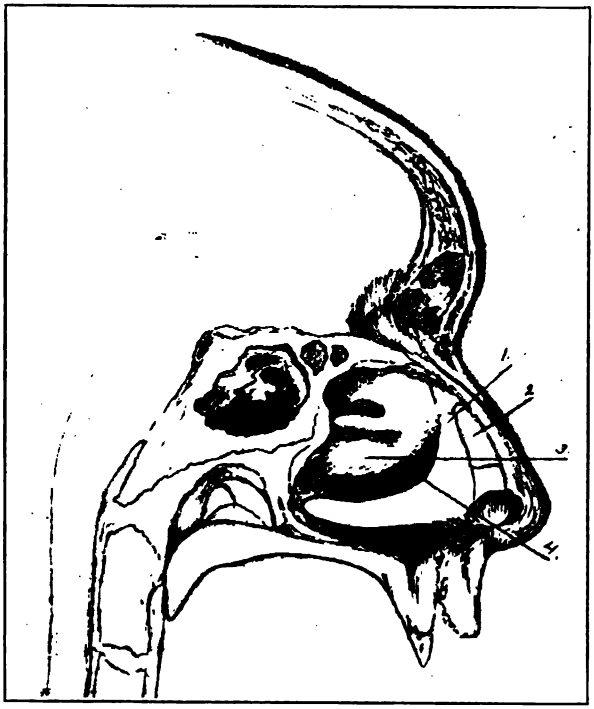

FIGURE 2.

Lateral wall of left nasal passage. (Denuded of mucous membrane.)

1—Ascending process of superior maxillary.
2—Nasal bone.
3—Middle turbinate.
4—Lacrimal sac.

The shortest and simplest way, then, to reach the lacrimal sac from inside the nose is to break through the thin bone underlying the sac and thus expose most of its internal surface. The area of bone to be removed is found just anterior to the anterior end of the middle turbinate and immediately below the level of its attachment to the lateral wall of the nose. It is to this area that West has given the name "torus lacrimalis," there being a slight convexity of the bone at this point, caused

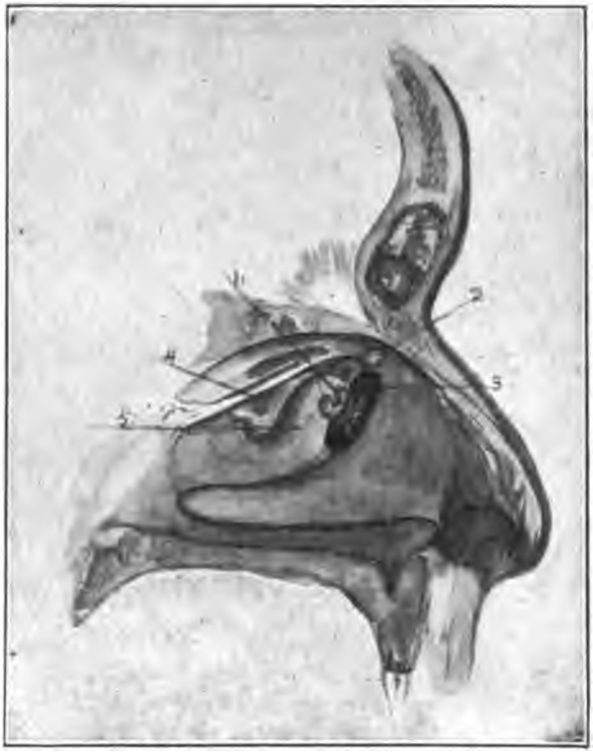

FIGURE 3.

Showing relations of lacrimal sac to ethmoids. (Middle turbinate removed.)

1 and 2—Anterior ethmoid cells, opened.
3—Lacrimal sac, exposed by removal of floor of lacrimal fossa.
4—Line of attachment of middle turbinate.
5—Uncinate process.

by the bulging of the floor of the lacrimal fossa. It is bounded anteriorly by the hard bone of the ascending process of the superior maxillary; above, by the anterior attachment of the middle turbinate and one or two anterior ethmoid cells; posteriorly, by the ethmoid labyrinth, and below, by the inferior turbinate.

Simplicity being a desirable element in surgical procedures, if not attained at a sacrifice of efficiency, it has been my aim to devise a technic which would enable one to secure the desired result with a minimum of manipulation, and with as small an armamentarium as possible. The object of this operation, to my mind, is the establishment of permanent drainage from the sac into the nose, this including the removal of a part of the lacrimal bone and the inner wall of the sac. Accordingly, I have devised an instrument (Figure 4) for this purpose, which so far has met all the requirements and has served to give the desired results. It is in the nature of a curette, oval in shape, with sharp edges, and set at right angles to the handle. The bowl is so turned that when in place in the nose, with the handle at an angle of about forty-five degrees with the perpendicular, the cutting edge of the instrument is directed downward. Having the bowl so turned has necessitated making the instruments in rights and lefts, although it is possible to omit this feature and use one instrument for both sides. I do not find the latter quite as satisfactory, although it can be done successfully.

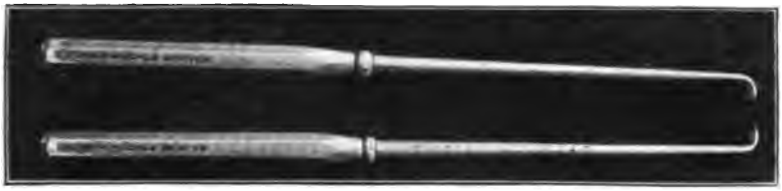

FIGURE 4.

Cut of curettes described in text.

Because of the lessened bleeding and because the patient can retain the head in extreme backward rotation, which is necessary to enable the operator to reach the field of operation, it is desirable to use only local anesthesia. This form of anesthesia has been found sufficient with the exception of two cases in children which necessitated the use of ether.

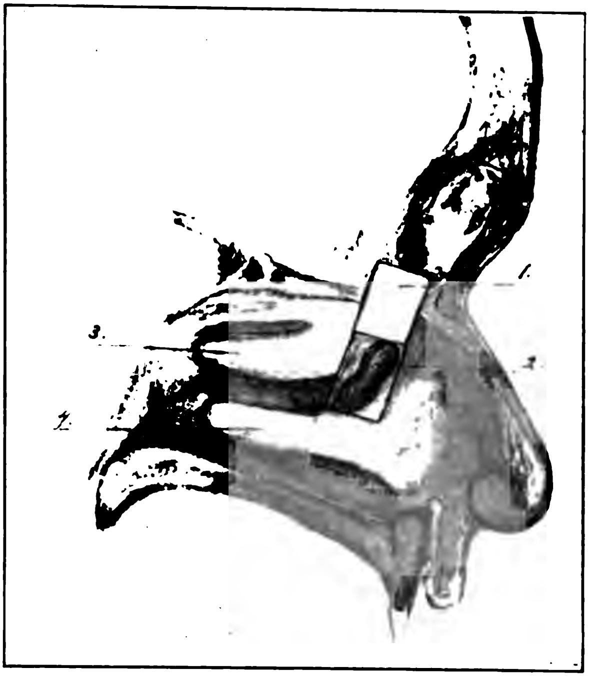

FIGURE 5.

Showing flap of mucous membrane elevated and turned back, with floor of lacrimal fossa removed to expose sac.
1—Flap to be removed.
2—Lacrimal sac.
3—Middle turbinate.
4—Inferior turbinate.

THE OPERATION.

After cleansing the operative field as thoroughly as possible and expressing the contents of the lacrimal sac, a ten per cent solution of cocain is instilled into the conjunctival cul-de-sac and applied to the mucous membrane of the nose. A one-fourth per cent solution of novocain, to which has been added adrenalin in proportion of three drops to the ounce of solution, is then injected under the mucous membrane of the nose overlying the area to be attacked, and also by direct puncture of the skin into the tissues surrounding the sac, particularly between the sac and the bone of the lacrimal fossa.

The lower punctum is now dilated and a number three or four Bowman probe is passed into the duct far enough that it will be retained during the succeeding steps of the operation, to serve as a landmark and as a firm background against which to curette for the sac after removal of the bone.

We are now ready for the intranasal part of the operation, and the first step necessary is the elevation of a flap of mucoperiosteum somewhat larger than the bone to be removed and from that location, this piece of membrane being taken out entire. It is quadrilateral in shape,.with its long axis running downward and somewhat backward, following the direction of the sac as shown in the illustration, and will be removed over an area approximately one centimeter in width by one and one-half centimeters in length. (Figure 5.)

The bone to be removed having been bared, it is my practice to approach the field of operation from in front, the curette now being brought into use for the first time. Knowing that the lacrimal bone is posterior to and articulates with the ascending process of the superior maxillary, it is an easy matter to feel one's way with the instrument until this yielding bone is reached, first palpating to feel the firm bone of the ascending process beneath the instrument, and working backward from that point to break through and curette out the thin plate of the lacrimal, thus uncovering about the posterior two-thirds of the sac. Once having broken through the lacrimal bone, it is an easy matter to complete its removal, always keeping in mind the size of the sac and its boundaries. Care must be exercised not to enter the ethmoid labyrinth posteriorly or above in the zeal of the operator to remove all of the floor of the lacrimal fossa, but this trouble should not arise if proper care is taken, as there is much greater resistance felt in going from the lacrimal into the ethmoid bone than in removing remnants of the former. The curette is now carried directly downward until it enters the duct, which it is advisable to open for a short distance, care being exercised not to open into the antrum, as the duct lies in the wall of the cavity. As soon as the instrument has penetrated the lacrimal bone, its position may be verified by bringing it in contact with the probe resting in the sac and duct, so that possibility of error is in this way obviated.

In most patients it is even now impossible to see more than the opening in the bone, for the sac lies out of the direct line of vision, but frequently it may be brought out into the nose by gentle manipulation of the probe. When this is possible, it is not difficult to clip off the internal wall of the sac with a small pair of scissors. This will not always be possible, however, and it may be necessary to insert the curette through the opening already made and, with firm counter pressure from the outside, remove the internal wall of the sac with one or two sweeps of the instrument. It is here that the presence of the probe in the sac proves of signal value, as it affords a firm background against which to curette, and will afterward be seen to come through freely into the nose, demonstrating the size of the opening obtained and the immediate success of the operation.

The shreds of tissue which the instrument has brought through into the nose are now removed with forceps, following this with a further curettement against the anterior external surface of the ascending process, to remove all remnants of the sac wall and smooth the bony surfaces remaining.

In one of my cases it has been necessary to do a partial resection of the septum in order to gain free access to the operative field, and it is also true that the middle turbinate is sometimes placed far enough forward that it is found to partly overlie the location of the sac so that it may even be necessary to resect a small portion of its anterior end.

I do not pack following these operations, and have as yet had no trouble with bleeding.

The postoperative treatment is of importance, and consists of two procedures: First, the passage of probes through the artificial opening into the nose until healing is complete, and, second, the application of small amounts of a sixty grain silver solution well into the nasal wound, to prevent excessive granulation and cicatricial closure.

I wish to thank Dr. May Tower Bigelow for her assistance to me in having made the excellent drawings which illustrate this paper.

V.

FUCHS' COLOBOMA WITH A LOOP OF RETINAL VEIN HIDDEN BEHIND FOLD OF RETINA.*

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Fuchs' coloboma of the optic nerve or the conus below, that condition we so frequently see in our patients, and that has, to some extent, become linked in our minds with a high degree of astigmatism, has led to a great deal of discussion since its classic description and interpretation by Fuchs.[5] While he considers it as being an analogue of the coloboma of the optic nerve, Elschnig[3] [4] sees in the conus below an expression of stretching of the eye tunics, due to their defective development, and Coats,[1] adopting this view, finds that "at present it is not justifiable to speak of inferior conus as a minimal form of coloboma at the nerve entrance."

Though it is perfectly true that instances of this condition, observed only clinically, cannot help decide positively in favor of one theory or the other, the case below deserves reporting because of certain characteristics and because it gives occasion to correct a certain omission in the literature.

W. J. McD., aged thirty years, railroad engineer, called for examination March, 1910, because vision had been found poor by physician. Vision O. D. = 5/9; vision O. S. = 5/9 + +. Retinoscopy under homatropin: R., + 0.75 ⊃ — 2.5 axis 180°; L., + 0.75 ⊃ — 3.0 axis 180°. Subjective test (homatropin, several examinations): R., + 1.0 ⊃ — 2.25 axis 180° = 5/3; L., + 1.0 ⊃ — 3.0 axis 180° = 5/3.

Right eye: Narrow scleral crescent at lower margin of horizontally oval disc.

Left eye (Figure 1): Fundus red; gray pigmentation in

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*Read at the Second Colorado Ophthalmological Congress, held at Denver, Colorado, August 1 and 2, 1916.

The real danger is that the glaucomatous attack arising from this cause, as from any other, will not be promptly recognized and treated. To avoid this the patient should remain under observation until recovery from the cycloplegic is seen to be well under way and progressing normally. If this is impossible, the patient should be warned of possible danger, or a miotic may be instilled to forestall any such possibility. The latter procedure I have rarely judged necessary; but there seems to be no reason why a miotic should not be used where the patient must pass from observation immediately after measurement under a cycloplegic.

The general symptoms caused by the various cycloplegics should be understood and borne in mind by every one who uses them. Homatropin is least likely to cause them, yet it sometimes gives rise to dizziness and uncertainty of movement, and I have seen it cause severe nausea and even vomiting. In patients with an idiosyncrasy, severe delirium may be caused by any of the more powerful and lasting cycloplegics, while dryness of the throat, extreme flushing of the face, and delirium may readily be caused in children. Such symptoms do no permanent harm, but they may be extremely annoying. The chance of their occurrence is a reason for the oculist to instill the cycloplegic himself. He will thus secure the best cycloplegia with the least danger of toxic symptoms, and will be ready to meet the poisoning if it occurs. The local hyperemia of the conjunctiva and lids that is caused by atropin and similar cycloplegics is more likely to arise when the drug is used over a long period, but it may be severe and troublesome after instillations to produce cycloplegia.

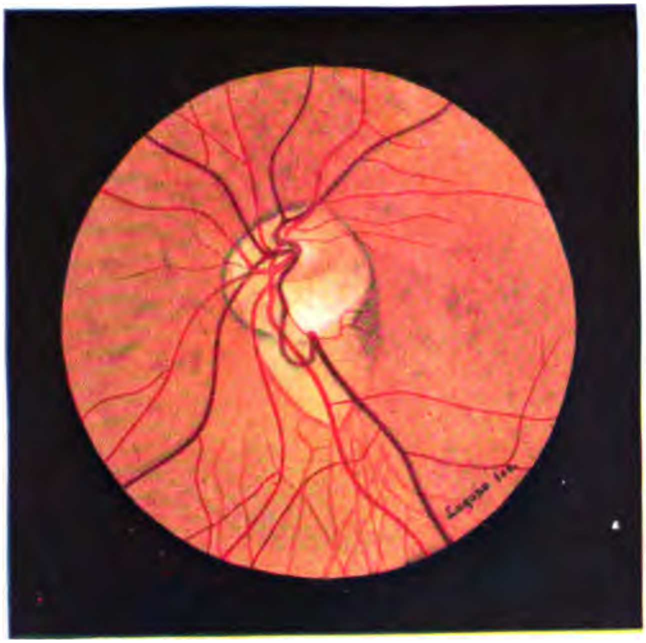
From this review of the desirable and undesirable effects of cycloplegics, we can estimate the part they may properly take in the study of ocular refraction. For a great many eyes the ametropia may be accurately measured without a cycloplegic. For any eye an approximate estimate of the refraction can be made without a cycloplegic; and for nearly all, a practical approximation to the real refractive condition, sufficiently close for practical purposes, can be arrived at without the use of a cycloplegic. Then, too, the cycloplegia furnishes no infallible guide, gives no guarantee against errors from faults in our methods of measuring refraction.

But when all this has been admitted, it remains true that something can be learned about the refraction of every eye by the use of a cycloplegic, and that on the whole the best prescription for glasses will be based on the broadest, most exact knowledge of the conditions present. Some eyes cannot possibly be correctly fitted with lenses without cycloplegia. Many more will not be so well fitted without it, because of the immense difficulty of measuring the refraction without it; and cycloplegia is also of value as a measure of ocular therapeutics. On the other hand, cycloplegia entails inconvenience, annoyance, or loss of time, rather than any important danger to the eye; although an eye submitted to it is to be carefully observed both before and afterward.

The decision, between the annoyance to be entailed and the probable benefit from the use of a cycloplegic, is one properly to be made in each individual case. Probably no intelligent, conscientious oculist, who attempts to correct convergent squint by convex lenses, will attempt to prescribe the lenses without cycloplegia; and very few will ever resort to a cycloplegic to study the refraction of a myope of over fifty. But between these extremes there is wide room for variations in practice. The facts and circumstances are to be taken into account in each individual case; and different practitioners will vary widely in the frequency with which they resort to cycloplegia.

In my own practice I find that of late years I have used it in just about two-thirds of all patients under forty years of age for whom I have prescribed correcting glasses; between forty and fifty, in six per cent; and after fifty, in a very small fraction of one per cent. Atropin is used in all children in whom it is attempted to correct convergent squint by wearing glasses; and some cycloplegic in nearly all for whom it is deemed best to prescribe glasses before the age of twenty. After thirty-five the proportion submitted to cycloplegics rapidly diminishes. It is reserved for those patients who show marked irritation or inflammation of the eyes, or who give a history of repeated failure to get relief from glasses carefully chosen without cycloplegia.

The decision depends on the answers to these questions: How serious is the condition present? Does it threaten permanent damage to sight, as by established squint, or increased


Laguna fec.

intervascular spaces of choroid around posterior pole; at periphery, poor in pigment and choroidal vessels clearly visible. Disc oval, with its longest diameter horizontally, and lower margin approaching a straight line; grayish in color, more on temporal part. The very large, shallow, sloping excavation is opening downward and extends to the temporal lower margin; all vessels appear at upper nasal margin of excavation. At the lower margin of the disc is an area which together with it forms approximately a circle; this area has the shape of a horizontal crescent; its horizontal diameter is slightly larger than the horizontal diameter of the disc, and the vertical diameter (width) equals the vertical diameter of the disc; it coincides with its concavity with the lower disc margin, while the two points of the crescent adjoin portions of the nasal and temporal margin of the disc respectively. A broad gray line of pigment surrounding area composed of disc and crescent forms an incomplete circle with the break below; its lower temporal end broadens and is gradually lost in the surrounding fundus. A vertically oblique, well defined line beginning at the lower margin of the disc and extending to within a short distance of the convex margin of the crescent divides the crescent into a nasal and temporal part: (a) the nasal portion is yellowish and lies in the level of the surrounding retina; (b) the temporal portion lies distinctly behind the level of the surrounding retina, and especially behind the nasal portion just described is grayish white and contains numerous ill defined small gray spots. A narrow crescentic portion at the extreme lower temporal margin of this part of the crescent is yellowish and by a narrow bridge is continuous, near the convex margin, with the nasal portion; the above described oblique line and the line separating this narrow part from the gray white temporal portion forms a V-shaped line, with the angle of the V near the convex margin of the crescent. At the lower margin of the circle composed of disc and crescent is a triangular area with curved sides, not very sharply defined, decidedly more yellow than the surrounding fundus. The height of this triangle equals about the size of the horizontal disc diameter. This area is remarkable for the absence of all details of the choroid, such as veins, pigmentation, etc.; this is made more striking because of the characteristics of the fundus adjoining it below. This part of the fundus is circumscribed approximately on the right and left by the lower nasal and temporal venous trunks respectively, and begins above at the lower nasal margin of the crescent and at the two sides of the triangle just described, while its lower limits extend pretty well forward and gradually blend in the periphery with the fundus, which here shows similar characteristics; it is of yellowish color, shows little pigment in the intervascular spaces of the choroid, and the choroidal vessels can be seen distinctly as yellowish red narrow bands; some of these can be followed even into the nasal portions of the crescent. The contrast between this region and the fundus to the right and left of it is quite striking, because on each side the fundus is much more red, shows marked pigmentation in the intervascular spaces, and because the choroidal vessels are not visible.

The central retinal artery appears in the upper part of the physiologic excavation, runs for a short distance undivided downward and to the nose, and then, still on the disc though very near its lower margin, breaks up into three main trunks, for the upper, nasal and lower region of the fundus, respectively. The veins from all portions of the fundus unite to form on the disc three main trunks, corresponding to the arterial distribution; these trunks remain separate but seem to unite in the depth of the physiologic excavation. In their effort to reach their destination the upper and lower venous trunks make that characteristic bend so well described by Fuchs.[5]

On the inferior vein the following interesting and rare condition is noticeable: Coming from the lower temporal portion of the fundus, the vein in its course upward to the disc runs more or less parallel to the artery, is clearly visible all the time up to the point when after crossing the lower margin of the disc it reaches the angle of the above described V-shaped line. Here it suddenly makes a sharp angular bend backward and downward in order to reach a new position at the nasal side of the vertically oblique part of the V-shaped line; in this new position the vein forms a U-shaped loop, crosses distinctly behind the artery and remains indistinctly visible, as if seen through a thin gray veil, until it suddenly reappears, sharply outlined and saturated in color, at the upper part of the vertically oblique line and here forms a part of it. From here on the vein remains distinctly visible up to its union with the other trunks in the depth of the physiologic excavation.

A fine branch, given off by the inferior arterial trunk at the point immediately below the disc, where artery and vein are almost in contact with each other, crosses in front of the vein, then running in a vertical direction downward it forms part of the V-shaped line down to its angle and here passes through the angular bend; reappearing on the other side of the bend, it ends in fine ramifications near the lower temporal margin of the crescent.

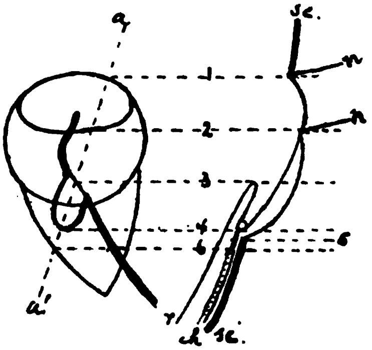


FIGURE 2.

a a1—Plane of section.
sc —Sclera.
ch —Choroid.
r —Retina.
on —Optic nerve.
1–2 —Obliquely placed disc with large excavation.
2–5 —Staphyloma of sclera (thin).
3–4 —Fold of retina with vein.
4–6 —"Defective" choroid, below it choroid of normal thickness.

Examination of the field of vision with a circular five millimeter test object showed an increase of the blind spot in its vertical diameter, making it extend with its upper margin to about fifteen degrees above and with its lower one to about ten degrees below the horizontal meridian.

Several things will be easily recognized in the above description: (1) The horizontally oval disc, flattened below; the sharp point at the temporal margin described by Fuchs,[5] is missing in this case. (2) The crescentic area at the lower margin of the disc, forming with it a complete circle: the conus below, Fuchs' coloboma. (3) The rarefication of pigment in the lower part of the fundus, first described by Adolf von Szili.[6]

Some features, on the other hand, are more unusual and, therefore, demand more detailed discussion: (a) The nasal portion of the crescent, with its yellowish color and ending in a sharp, well-defined, vertically oblique line. In a part of this area the choroid seems to be fairly normal, as evidenced by the vessels extending into it from below, and the retina probably extends in a single layer over it. In that other portion of it, close to the vertical line and near the loop, the choroid is apparently more defective, and the retina most probably is doubled over it. These assumptions are made on what has been found anatomically in cases of coloboma and in conus at the temporal side of the disc, and are best proven by the two features to be mentioned presently. (b) The temporal portion of the crescent which lies distinctly behind the level of the surrounding fundus, especially at the line separating it from the nasal portion. We must, I believe, interpret it as the almost bare sclera, which is in this place seen through a single layer of retina, without any intervening covering of choroid, excepting for traces shown as the numerous small grayish spots. We must further assume that in this neighborhood at least, but most probably also in the structures adjoining, the sclera is bulging backward, forming a staphyloma. The staphyloma most probably also extends into the nasal portion of the crescent, but with this difference, that in the nasal portion the choroid is present, to some extent at least. That such is really so we must conclude from (c) the U-shaped loop, a condition which apparently is quite rare, because it has been found only by Adolf von Szili,[7 8] and by Coats,[2] in all only eight times. The sudden bending back of the vein at the angle of the V-shaped line, and the peculiar veiling of the loop throughout its course, can be explained only if we assume that at that angle the retina and the vein lying in it, utilizing the cavity formed by the staphyloma of the sclera, bulged backward and thus came to lie behind the retina in its normal condition, thereby forming a duplication through which as a veil the vein can be seen indistinctly. (d) The triangular light yellow area at the lower margin of the crescent seems to be a rather rare formation, since I have been unable to find a similar condition depicted in the literature of conus below. This area must, I believe, be looked upon as representing a defective part of the choroid which here shows marked absence of pigment and of larger vessels, and thereby contrasts greatly with the choroid adjoining, where the fundus is more red and the choroidal vessels can be seen as distinct reddish bands. Into the upper part, at least, of this area the staphyloma must extend, because of the presence in it of the loop.

Summing up, there is very little doubt that the condition described shows several characteristics of the classic coloboma of Fuchs, in addition also features not ordinarily observed in these cases. As such stand out the difference in level (greater myopia) of the temporal portion of the crescent, the sharp fold of the retina forming the vertically oblique part of the V-shaped line, the veiled U-shaped loop, and the triangular pale yellow area. All this must, to all appearances, be interpreted that a staphyloma of the sclera with at least partial absence of the choroid over it, allowed a part of the retina, which otherwise extends continuously over it, to bulge into the staphyloma, dragging the vein lying in it along. It is only natural to conclude that this condition was in all probability formed during fetal development, and that it is not the result of later stretching, based on defective development. The loop may have formed during the time when the vessels sprouted from the optic nerve into the retina; at that time the vein for the lower fundus region, impinging on the retina, bulged it out into the staphyloma of the sclera until further development and growth forced the vein to reappear in the normal level. In support of such theory might be adduced the remarkable fact, emphasized by v. Szily,[9] that in all cases the hidden vessel was found to be a vein; this was also the case with the patient of Coats.[2] Or we may assume that, still during fetal life, the faultily developed and more dense choroid of this region dragged the retina, and with it the loop, downward.

Assuming that the explanation given is the correct one, and that we are dealing with an instance of conus below, showing at the same time features of a decided coloboma at the nerve entrance, it must be admitted that it does not necessarily follow from this that all cases of Fuchs' coloboma must be explained in a similar manner.

Whatever view will ultimately be accepted as to the nature of the conus below, and especially of the class of cases like the one reported, that much seems to be certain so far, that the underlying cause is one of faulty development around the region of the fetal cleft. And the question arises whether this helps to give an explanation of the marked astigmatism so often found in these conditions. Fuchs,[5] and more recently again Worton,[10] emphasized the fact that the coloboma is mostly found in the direction of the meridian of strongest refraction; this is again the case in our patient. Let it be understood that our patient showed with the ophthalmometer corneal astigmatism of an amount well corresponding with that found by other methods, such as retinoscopy and the subjective test. We can assume that because of the faulty development in the region of the fetal cleft, insufficient consolidation and defective firmness of the outer coats, and especially of the sclera, allowed the cornea to assume in the horizontal direction a curvature of greater radius and, therefore, of weaker refraction; in the direction of the fetal cleft, on the other hand, the sclera being of normal consistency, it compelled the cornea to assume the curvature characteristic for that particular eye. This explanation would, in other words, emphasize that the meridian of stronger refraction is the normal one of that particular eye, and that the weaker (abnormal) refraction of the horizontal meridian was caused by defective development of the fetal cleft.

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*The figure 3 is identical with figure 2, Tab. 20, in "Augenspiegelstudien," etc.

VI.

COMBINED USE OF CROSS CYLINDER AND ASTIGMATIC DIAL.*

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Although refraction is so extensively done from day to day by so many workers, comparatively little concerning methods of refraction appears in the literature. This is of course largely because the subject is regarded as one of established routine, with but little room for further development. Accurate refraction is indeed in great degree a matter of patience and exactitude rather than of originality, although we are often reminded of a statement that genius is the faculty of taking pains.

The purpose of this paper is to suggest the combined use of two methods already employed for the determination of astigmatism. It is probable that a number of workers who are familiar with both methods may have used them to check one another. But the occasional use of the astigmatic dial, after some years of reliance upon the cross cylinder, the astigmatic dial being used for some time merely as a check upon the results obtained with the cross cylinder, has recently suggested to me the combined use of these two tests along lines which I have not heard mentioned by any other worker, and which I believe may be found to furnish a rather useful addition to the means at our disposal for the accurate determination of both the axis and strength of the astigmatic error.

It is probable that there are few or no refractionists who are not fairly familiar with the principle and application of the astigmatic chart in its various forms, such as the clock dial and the cross-hatched circle. For many years the clock dial has been in very popular use for the subjective estimation of astigmatism. Like every other subjective test, the results obtained with it are at times delightfully clear and prompt, and again provokingly uncertain and variable. It often happens that the patient is unable to select the two principal meridians of greatest and least sharpness of line as definitely as the examiner would desire; and while this is sometimes due to the presence of an unusual amount of irregular astigmatism, such is not always the case. Many patients who present this particular difficulty can be made to reveal a definite amount of regular astigmatism, and are capable of high visual acuity. On the other hand, as regards the amount of the astigmatism, some patients appear surprisingly unable to comprehend the language in which questions are put to them, and answer in one sense while the ophthalmologist is thinking in another.

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*Read at the Second Colorado Ophthalmological Congress, held at Denver, Colorado, August 1 and 2, 1916.

To escape from some of the difficulties presented by the astigmatic dial, Dr. Edward Jackson some years ago devised what is known as the cross cylinder. This consists essentially of a lens mounted at the end of a handle which is at forty-five degrees with the cylindrical axis, the lens being ground on one side as a sphere, and on the other side as a cylinder of twice the strength of the sphere and of the opposite denomination. For example: A + 0.25 sphere may be combined with a — 0.50 cylinder, or a + 1.00 sphere with a — 2.00 cylinder. A simple and quick rotation of the handle between the thumb and finger of the examiner, while the lens is held a short distance before the eye of the patient, or before the lens in the trial frame, at once reverses the axis of the plus or minus cylinder, according to the sense in which we think of the combined lens, at the same time leaving the mean spherical strength before the eye unchanged. I believe Dr. Jackson at first proposed and used this cross cylinder merely for the estimation of the strength of cylinder required, and that he later applied this piece of apparatus to determining the axis. In deciding the strength of cylinder, the cross cylinder is so held that its principal axes coincide with the principal axes of the cylinder in the trial frame, if one has been placed there. In deciding the axis, the handle of the cross cylinder is held coincident with one of the principal axes of the cylinder in the trial frame; the effect of revolving the cross cylinder being in the latter case to present to the patient a new plus or minus cylindric effect, compounded of the lens in the frame and the cross cylinder, and having its principal axes somewhere intermediate between the principal axes of the lens in the frame and of the lens held in the operator's hand.

The cross cylinder has been too much neglected by refractionists. To those who have become thoroughly familiar with it, it has proved of great value, and it has the particular virtue that it can be employed without changing from the test type to the dial. The cross cylinder is, however, in its turn at times rather decidedly misleading and uncertain; this being very seldom the case as regards determination of the axis, but more frequently so concerning the strength of cylinder required. In my own experience it has seemed that this trouble was to be explained as follows: Since letters arranged in horizontal series or lines tend to appear to blend more or less with one another when elongated horizontally, and to be more separated from one another when elongated vertically, many patients are rather disposed to select as clearer that position of the cross cylinder in which the vertical elongation occurs. This position is the one in which the effect is that of a plus cylinder held with its axis more or less horizontally, or, what amounts to the same thing, of a minus cylinder held vertically. This source of error may be avoided more or less by careful explanation of the test to the patient; but even with intelligent patients and a careful statement of what is called for, the difficulty seems at times hard to overcome. It is of course less likely to arise with a patient who is thoroughly under the influence of a cycloplegic. Where it is encountered, we have thus the effect of a reduction in the apparent amount of direct astigmatism present, or an increase in the inverse astigmatism.

Being persuaded that this source of error in the use of the cross cylinder was a factor to be reckoned with, and yet at the same time not caring to place sole reliance upon the astigmatic dial in testing for astigmatism, I gradually resorted to a coordination of the two tests. I still rely upon the cross cylinder, usually in the + 0.50 with — 1.00 combination, for the finer adjustment of the axis of the cylinder, but I have come gradually to depend more upon the clock dial than upon the cross cylinder for ascertaining the strength of cylinder required. Of late my procedure is rather commonly as follows: After arriving at an approximate estimation of the spheric correction of the eye, I place the ordinary clock dial before the patient and ask which line is most distinct, and then rather quickly reach an approximation of the strength of the cylinder. After readjusting, if necessary, the spheric lens, I use my cross cylinder to obtain an exact placing of the axis. Then with the Thomas astigmatic chart (a revolving disc having only two sets of intersecting lines at right angles with one another) the two principal meridians are exactly estimated. In many instances, after preliminary use of the retinoscope, the Thomas revolving chart is the only one resorted to. The process of checking and rechecking is of course, as with any system of testing, repeated as often as may be necessary; such repetition being, however, usually more beneficial by means of a second or third appointment than at a single and too prolonged investigation.

I have found it possible, and at times advantageous, to make an even more intimate combination of the astigmatic chart with the cross cylinder. With the patient looking at the chart, a more or less weak cross cylinder may be revolved before the patient's eye, and, if dealing with the strength of the cylinder, the question is put as to which aspect of the cross cylinder makes the principal meridians most closely resemble one another; or if the axis is to be determined, which way the whole dial appears of more uniform intensity. In testing my own eyes I found it strikingly easy to detect the difference in uniformity of the lines brought about by revolving a cross cylinder combination as weak as + 0.12 sphere combined with — 0.25 cylinder. On account of the increased contrast produced as regards strength of cylinder, it is sometimes possible to get more precise responses from somewhat dull patients than by the usual addition or subtraction of a simple cylinder. This test, as with every other subjective test, is influenced by the mentality of the patient and the ability of the examiner to make his purpose clear.

In closing, it may not be amiss to say a word concerning an objection which has been made to the astigmatic dial. It has been argued that the dial is unreliable, inasmuch as, by subtending a larger visual angle than that of the smallest letters which the patient can see to read on the test card, it may bring into play a larger area of the cornea and lens than do the small test type, and thus affect the determination of astigmatism by the inclusion of areas whose curvature varies from that of the part of cornea and lens immediately adjacent to the visual axis. It seems to me that this objection is not optically admissible. The rays of light from a given object, whether small or large, do not pass merely through one very limited part of the area of the cornea and lens corresponding to the diameter of the pupil at the time of examination, but a large number of diverging rays originating at each single point on the object seen traverse these tissues; to be brought more or less perfectly to a focus at a corresponding point on the retina. Thus, whether the patient looks at a very small test letter, or at the more extended lines of the astigmatic chart, presumably almost, if not quite, the same areas of the cornea and lens are brought into play.

In using the combined methods here discussed, I have felt a definite increase of precision in some of the more difficult refraction cases with which I have had to deal, and I hope that others may benefit in like manner by the use of the technic which I have described.

VII.

TREATMENT OF CATARACT DURING THE EARLIER STAGES.*

H. M. THOMPSON, M. D.,

PUEBLO.

When Edward Jenner communicated his observation to John Hunter that dairymaids enjoyed apparent immunity from smallpox, Hunter's characteristic retort was: "Don't think, try; be patient, be accurate." A few years back I would have brought this subject before so learned a gathering with a greater hesitation and feeling of temerity than I do today. Even now I anticipate that, any thought you may deem fit to confer upon the subject will be in the mood of skepticism, and any criticism will tend toward the destruction of the theory of treatment and lay credit for the results in definite verified cases to the matter of coincidence, or the perversity of physiologic or pathologic processes. However that may be, the trail has been blazed by no less an authority than our renowned Lt.-Col. Henry Smith,[1] the man who deservedly commands the attention of the ophthalmologic world. From the earliest times efforts have been made in many different ways to clear opacification of the lens, or to stay its progress. Some successes have been obtained, certain cases have cleared and held a useful vision for many years. Why not take Hunter's advice: be more patient and try?

Although E. L. Jones[2] brought this topic to your attention at the meeting of the Congress, July, 1915, reiteration will do only good, if there is any merit to the subject.

My attention was first directed to these cases some six years ago, not from any literature I had seen, but from the results of personal observation and an effort to do something in a condition where hopelessness prevails and "watchful waiting" is the usual treatment until such a time that the surgeon considers the case operable. Since that time I have carefully watched for these early cases where dust-like flaky opacities are forming in the lens, giving it an appearance as if the scattered deposits suspended in its substance were the fungus growth occurring in an old cocain solution, or the same formation in a long standing tightly corked bottle of distilled water. The lens is sufficiently clear to give you a view of the fundus, but with a plus lens woolly translucent opacities are seen scattered throughout, often having a predilection for the lower half.[3] These cases are not numerous. Often when they are discovered in this early stage, it is not possible to administer treatment because of the unwillingness of the patient to submit to what he considers a very severe procedure. Notwithstanding all this, I feel that the willing and obedient patient should be given every opportunity to stay or relieve the process, if found sufficiently early. I cannot agree with some men,[4] who claim we do not see this early stage described by Col. Smith, because this particular change does not sufficiently interfere with vision in the private patient to cause him to consult an oculist. I consider the reverse true; this individual will often promptly consult an ophthalmologist at the first appearance of a distinct haze.

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*Read at the Second Colorado Ophthalmological Congress, held at Denver, Colorado, August 1 and 2, 1916.

Although it is an ancient aphorism that a "man is no older than his arteries," it is a deplorable fact that only in recent years have we come to a clearer conception of the symptom complex resulting from the toxic phenomena and the subinfections. We all agree that arteriosclerosis, with its cardiovascular disease, is the parallel of senile degeneration, and the blood pressure the sign-post which points to the relative age of the individual. If you will class the man of thirty with sclerotic degeneration of his arterial system as senile, then I am in perfect accord that you allow the term "senile" cataract to remain as it is—ancient and fixed in its nomenclature. You will remonstrate with me. You will say this man is diseased because some irritant poison in the form of a toxin or bacteria has gained ingress to the blood stream. Yes, the man is diseased. The eye which develops an opacification of the lens to a degree sufficient to impair function is a diseased eye, and should not be designated as "senile." It has been said by Treacher Collins, E. L. Jones,[2] and others that the cortex of the lens may become perfectly opaque while the sclerosed nucleus remains clear. I wish to add that the hardening of the central fibers is the natural process of development. These elongated central epithelial cells are the oldest, the clearest and the few cells in the whole anatomic system in which the nutritional metabolism is at the lowest ebb. If the change were a senile condition, the obvious conclusion, it seems to me, would be that the sclerosed nucleus should be the part first affected. A fact with which every layman is familiar is that cataract is not a frequent condition even in the very old. Centenarians are living who have satisfactory near and distant vision. Last year I showed a case of a man under thirty, who had an apparently typical socalled "senile" cataract in one eye, with the good eye progressing to the same change, following, no doubt, uveal tract changes, which I believe were due to an intense eye strain. Risley,[5] in 1889, emphasized strongly the misuse of the word "senile" as applied to cataract. He contended "that the term 'senile' should be eliminated from our nosology, and all opacities of the lens regarded as pathologic." Gerok's table[6] shows that cataract actually decreases after the age of eighty years. It appears evident, therefore, that cataract, occurring so infrequently in the aged, is not a necessary concomitant change of advancing years, but a definite manifestation of some pathologic condition in the uveal tract; impaired nutrition of the delicate intraocular mechanism, resulting secondarily from some general dyscrasia combined with local predisposing factors. In this sense cataract is always a secondary disease.

The endogenous infections entering the blood in an attenuated state from the alveolar[7] abscess and the chronically inflamed pus-ladened gums, the subinfection[8] arising from a chronic stasis of the intestinal tract, and the toxic products[9] absorbed from putrefaction of the stagnating material in the lower intestinal canal, all play their destructive part in causing cardiovascular degeneration with atheromatous changes in the arteries. These changes can be general or confined to a particular part. We find this exemplified in arteriosclerosis of certain parts of the brain, the sclerotic kidney and arcus senilis.

The same changes can be located in parts of the uveal tract, thereby affecting directly the metabolism of the lenticular substance.

Modern investigation tends to the teaching that many of the obscure degenerative processes to which we are subject have their origin in one of the above factors, particularly to infections coming from the buccal[10] cavity, the place wherein germ life abounds and from which more trouble finds its source than that coming from the remaining part of the alimentary tract. When you consider the average individual of the thoughtless strata of society, you wonder that he survives so many years, carrying with him a cultural ground the equal of which exists in no other part of our anatomy. Allowing that Michel,[11] Karwat, von Brommel and Nickelsburg were partially correct in their assumption, some years back, that atheroma of the vascular system was responsible for cataract, we should extend them more credit because of our recent conclusions as to the etiology of these degenerative changes.

Next in importance to the above general causes should be classed eye strain. Through many years the coats of the eye have been subjected to an insidiously chronic hyperemia with the resulting permanent and serious damage, due to a long continued asthenopia or other symptoms of an uncorrected error. How many of you can eliminate these symptoms in your cataract cases, if you will elicit with care their past history; and, again, how many of you, who have had years of ophthalmic practice, have seen the socalled "senile" cataracts come to operation in patients whom you know absolutely to have had a proper correction in early life? I emphasize the word proper as referring to a perfect correction of astigmatism and a sufficiently full correction of the hyperopia. The lens receives its main source of nutrition by the diffusion of the necessary pabulum through its capsule and the capsular epithelium. The aqueous is secreted by the ciliary body, assisted, probably slightly, by the iris. We assume that the patient from some general "diathesis" is predisposed to or already had developed an arteriosclerosis. It is not unreasonable to believe that this patient, with an uveal tract scarred by an eye strain of many years' standing, will have a blocking of the vessels of the ciliary body, a change in its eipthelial covering and, of necessity, an impaired function with an alteration of the aqueous which it secretes. With the chemical composition of the aqueous altered, the nutritional properties are lost and a harmful substance produced, the capsular epithelium degenerates, and by the process of diosmosis these products enter the lens and we have the beginning of opacification of the cortical fibers.

Otto Becker,[12] as early as 1883, showed that the first opacity does not occur in the fibers themselves, but as granular masses or vacuoles between the fibers. These masses are coagulated albuminous products. Salffner, by his experiments with naphtha, Leitner and others proved that the primary lesion was in the subcapsular layers. Foerster,[12] by an examination of seventy-two cataracts, found that the nucleus of the lens was never opaque.

Considering the general etiology, the local primary changes in the vessels and the epithelium of the ciliary body, the modified aqueous and the breaking down of the subcapsular epithelium, the possibility of removing the causative factor and of allowing a reconstruction of the damaged cells seems most feasible, worthy of medical attention, and deserving of proper therapy.

It is necessary when instituting treatment to select the cases which will give a reasonable chance of being amenable to proper care. The opacity must not have reached a state of marked change in the lens fibers, and the vision should not be reduced beyond 20/40. I do not believe treatment advisable when the opacity has reached an advanced stage.

Allowing that there is no specific remedy for cataract, a secondary condition, arising from diseased changes elsewhere, we must of necessity determine the state of the general health of the patient. His personal history, occupation, habit of living, should be considered. A careful physical examination should be made by a competent internist. This will include blood and urine tests, the determination of the blood pressure, and all procedures applied that tend to a definite finding in each particular case. Any abnormal or pathologic change must be treated accordingly. In all cases special stress should be placed on the regulation of the diet, increased intake of water, and frequent eliminative treatment by calomel and salines. In addition, in those cases in which no special lesion shows, beyond the atheromatous arterial changes, potassium iodid should be administered in small doses over a long period of time.

The local treatment has always been considered of greater importance than the general; however, I believe local measures often fail when the causative factor is not sought and rendered less harmful by appropriate general care.

Local therapy is best divided into three heads: 1. The subconjunctival injections of cyanid of mercury, as used by Col. Smith,[13] are most valuable, but in private practice not always practical, because of the pain and the marked reaction producing an undue amount of fear on the part of the patient. In one case of beginning opacity, where a 1/4000 cyanid was used, I was unable to allay the patient's dread and assure her that no harm and only good was done, until the patient actually realized she had obtained a clearer vision. If the eye does not respond to treatment, this attitude of the patient is overcome with difficulty. However, I use the cyanid in severe corneal ulcers, pannus and all cases of severe keratitis, but, as a rule, precede it by one or two injections of dionin. With me, dionin, both instilled and used subconjunctivally, is to the eye as is calomel to the alimentary tract—a panacea for many forms of eye disease. I instill it under the conjunctiva from two per cent to five per cent, using no definite quantity. Under cocain anesthesia there is little pain, and if the patients are allowed to remain for a time in the office after the injection, they do not realize how badly the eye appears and experience no undue fright.

2. Mechanical effects of eserin. In my practice I prescribe a one grain to the ounce solution of eserin sulphate to be instilled into the eye night and morning. My belief is that eserin aids in a threefold manner: it frees the root of the iris, thereby enlarging and freeing the filtration angle; removes pressure from the ciliary vessels, allowing, as far as possible, an unimpeded circulation; the surface of the iris is widened, and any function it may have of excretion and secretion thereby enhanced; and, lastly, by producing a hyperemia, probably increases the nutritive possibilities. The slight headaches that often follow its use are most transitory.

3. Eye rest. I am fully convinced that the eyes in these cases should have all possible rest. This view absolutely con-

troverts the method Bissell[14] has followed for fifteen years in his treatment of early cataract. He endeavors; by changing a dotted card from twenty inches up to ten, to exercise an exhausted accommodation. By this method he most obviously does damage to the already degenerated cells. Following this statement, he advises prescribing a correct glass. Truly, here is the reductio ad absurdum. He first desires excessive accommodative fatigue, and in the next line suggests perfect rest with glasses.

Hyperopia and all the astigmatic errors, whether a fixed condition or one produced by swelling of the lens, should be carefully corrected. Tinted glasses should be worn when the patient is exposed to bright light.

Of nine cases treated in the last seven years, whose history I have followed, two, where the vision was reduced to about 20/40, with the exception that one patient with one eye read a part of 20/30, returned to acute normal vision. A third was a man of eighty years, whose one eye showed a well advanced cataract, the other a hazy lens with less than 20/30. With several months' treatment this patient developed normal vision in this eye, and retained it for distance and near over five years, dying recently of cancer of the stomach. His refraction of + 1.00 cylinder at off-axis remained constant over this period. A fourth case, which well repaid me for all my efforts in this direction, was my wife's mother, who for a year previous to coming to Colorado had complained of being unable to recognize people across the street. She was able and had been in the habit of often reading without glasses, although she was over sixty, and took the following correction: O. D., + 0.75 cyl. axis 135°; O. S., + 0.75 cyl. axis 45°. She had always been given a sphere for near, by her eastern oculist. This case showed stellate opacities, more marked at the equator and extending towards the center, with the interspaces filled with the fine dust or flaky changes. With correction her vision was: O. D., 20/40; O. S., 20/40 + +. She has followed treatment carefully from time to time during these five years. The dust opacities have cleared from the interspaces and in the center of the lens. The patient's vision on April 1, 1916, with O. D. + 1.25 cyl. axis 135°, O. S. + 0.75 ○ + 0.50 cyl. axis 165°, was O. D. 20/30, O. S. 20/20 + + +. This case enjoying excellent health, I am convinced beyond any doubt that had she worn a proper correction for distance and near, beginning say at the age of forty, she would not have developed cataract, the eye strain having been the cause of the opacification of the lens. At the age of sixty her nucleus was not extensively sclerosed, the proof of which was the fact that she continued to exercise sufficient power of accommodation to read without glasses. For years she had had a slight and annoying conjunctivitis, which disappeared when she wore her proper correction.

Two other cases gave me a satisfactory improvement in vision, which has remained constant for two and three years respectively. The three remaining cases gave me no improvement on three to six weeks' treatment; one having only 20/100 vision, with marked opacity formation, should not have been treated.

Although we now operate before the lens matures, I do not consider it good therapy to treat a too far advanced cataract. It is poor practice, because of the possibility of delaying maturity, and I am sure we all prefer a "ripe" lens as being more satisfactory to operate.

If life is worth living, it is worth living well. If the practice of medicine is all we wish it to be, then it is high time we consider it in all the detailed possibilities of its therapy. If you recognize cataract as a pathologic condition, resulting secondarily from numerous and diverse causes, as I have heretofore touched on and others omitted, then you should be in accord with me and my findings, although limited, that the field offers possibilities well worth the attention of each and every ophthalmologist, if he will carefully select his cases.

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VIII.

CYCLOPLEGICS IN THE MEASUREMENT OF AMETROPIA.*

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There are many methods of measuring ametropia. To use most of them in the measurement of each case would be impossible. Each ophthalmologist must select those he will use; and having mastered these, his success will depend on the thoroughness with which he employs them and his knowledge of their special limitations and defects.

The choice of methods varies widely. Not only are there differences of opinion between different workers in the field, but there are differences between the methods used by the same worker at different stages of his career; and differences in the methods used widely by the profession in general at different periods. Thomson, in the earlier years of the correction of ametropia for eye strain, made much use of the subjective test with a point of light; and others followed his method. Twenty years later Hotz brought out a modified test of the kind, and its popularity was rather widely renewed. In 1891 Culbertson proposed his prismometer. It was adopted by many, but later fell into disuse. Last year Krusius and Borchart described anew this test, which has been patented in Germany, and urged its advantages for the testing of school children. In my own work I used for years three parallel lines that could be turned in different directions as a means of fixing the principal meridians of astigmatism. But later I gave up this test for skiascopy and the ophthalmoscope. The use of cycloplegics has stood the test of experience from the days of Donders to the present time, but has given rise to wide differences of opinion and has been discussed with a good deal of partisanship.

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The use of a cycloplegic is not directly a method of measuring refraction. It is an auxiliary procedure, employed to make measurements of ametropia by various methods more correct and exact. In making their selection of methods some oculists reject it, while others consider it essential for all cases under a certain age, say forty years. We must recognize that it is one of our methods, not the only one; and that it may be used or not as the individual practitioner judges best. But it should not be forgotten that the scientific soundness of the ophthalmologist may be judged by the methods he chooses as well as by his proficiency in them.

Cycloplegia is of value: (1) As a means of fixing temporarily the refraction of the eye, giving the advantage of a fixed quantity to measure. (2) The refraction is fixed with the ciliary muscle in a state of rest, the supposed condition of accurate focusing with the least effort. (3) The accompanying dilatation of the pupil magnifies the effect of imperfect focusing, and so makes the subjective testing of refraction more exact. (4) Rest of the ciliary muscle relieves the eye strain, lessening congestion and improving visual acuity, and so aiding the subjective measurement of ametropia.

The importance of having a fixed quantity to measure is obvious. To measure the length of a piece of elastic rubber band, or the height of a boy who is jumping up and down, is not more impossible than to measure the ametropia of an eye the refraction of which is constantly changing. But the rubber band, freed from all tension, has a certain length, and the boy at rest has a certain height that can be measured. Similarly, the refraction of the eye with the ciliary muscle at rest becomes a definite fixed quantity.

The theory of use of a cycloplegic is that it produces this state of rest, relaxing the ciliary muscle as it relaxes the sphincter of the iris. Of the drugs used to cause cycloplegia, very much less is required to dilate the pupil than to paralyze the ciliary muscle. If the pupil be not dilated and fixed to ordinary changes of light, it is perfectly safe to say that the accommodation is not paralyzed. But the pupil may be fully dilated and fixed, and yet considerable power of accommodation be still present.

However, it is not difficult to produce complete suspension of accommodative power with either of the cycloplegics commonly used in practice. The common obstacles to be overcome are a state of inflammation or irritability in the eye which may make the nerve tissue more resistant to the drug, and which certainly hinders its free absorption; and inefficient application.

The inflamed and irritable condition is overcome by the prolonged use of the cycloplegic. If the condition is due to eye strain, the drug properly applied always exerts enough influence to stop the use and strain of the eyes; and commonly a few hours or days brings about the cycloplegia desired. Inflammation due to causes other than eye strain, or which has caused structural changes in the eye, may be more obstinate.

But the common cause of failure to secure cycloplegia is inefficient application of the cycloplegic. This is what makes homatropin applied by the oculist a more reliable cycloplegic than atropin, a much more powerful drug, applied by a member of the patient's family. I have seen the unreliability of home applications of a cycloplegic illustrated many times, but never more strikingly than in a child seen while this paper was being written. I was asked to see in consultation a girl with convergent squint. The eyes were to be placed under the influence of atropin; and a solution of two grains to the fluid ounce of water, to be dropped in the eyes twice daily, was prescribed for the purpose. After two days the child was brought to me with the right pupil 4.5 millimeters, the left 3 millimeters in diameter, in moderate daylight, and both reacting freely to light. The grandfather said: "I put the drops in every time, but I did not do it quite like you do." I had the child's head laid on my lap, instilled a drop of one per cent solution of atropin in each eye, and held the lids apart for a minute or two. In fifteen minutes the pupils were each 7.5 millimeters in diameter and fixed to light. In an hour the accommodation was fully paralyzed. One knows if the cycloplegic has been properly used when he applies it himself; but not if it has been applied by untrained members of the patient's family, especially if a conspicuous "poison" label has inspired the idea that the less they get into the eye the safer it is.

To determine if in a particular eye the cycloplegia is complete or satisfactory, the shadow-test is a most rapid and reliable means. The subjective test with fine print, or other test object, admits certain sources of error that are excluded by skiascopy. Where variations in the lens chosen persist after the cycloplegic has been efficiently used, and all undue irritability has been allayed, they depend on variations of the refraction through different parts of the pupil, and these the movement of light and shadow in the pupil reveal. Aside from such variations, we have in any of the common cycloplegics, properly used, a reliable means of fixing the refraction of the eye.

Is it necessary to use such a method in order that an accurate estimate of the refraction of an eye may be made? If the stretching of an elastic tape be confined within a certain limit, it is possible to measure its length at the limit. If the change in the refraction of the eye is strictly limited, it can be measured when it reaches the limit. The limit in this case is complete relaxation of accommodation. The second advantage claimed for cycloplegics is that they fix the refraction of the eye at the limit of complete relaxation of accommodative effort.

Can complete relaxation of accommodation be reached in any other way? If it can, the refraction of the eye can be measured accurately without subjecting it to a cycloplegic. The older writings seemed to imply that the limit of complete relaxation was habitually reached in distant vision by myopes and presbyopes; but that only a small proportion of young hyperopes were capable of rendering manifest the whole of their hyperopia. These views were largely erroneous. It is certain that among young myopes spasm of accommodation not rarely adds to the real myopia present; and among young hyperopes are many who can fully relax their accommodation; while the majority can so relax as to reveal practically all their hyperopia.

The real difficulty is that until a cycloplegic has been resorted to, no one can know with certainty whether this particular patient can fully relax his accommodation or not. To the myope with spasm of accommodation, it is no help that nine other myopes reveal their true state of refraction without a cycloplegic. To the hyperope suffering with headache, it is no help that the other three out of every four could get relief without being submitted to a cycloplegic. It is no comfort to the presbyope, who goes from one to another without getting relief, that in most presbyopes the apparent error of refraction is the real one. It is the fact that certainty is secured in place of guesswork, that makes the use of a cycloplegic of such importance in the measurement of ametropia. A single guess may be brilliantly accurate. Repeated guessing may arrive at a result nearly always correct; but if scientific accuracy is of sufficient importance, every method that conduces to it is worth using.

Whether or not a cycloplegic produces strictly the lowest refraction of which an eye is capable—the highest hyperopia or lowest myopia—is still somewhat in doubt. Most cases in which higher hyperopia or lower myopia is observed without a cycloplegic than with it may be explained by positive aberration; the margin of the dilated pupil being less hyperopic than the center, which alone is exposed when the pupil is not dilated. But in the main the inaccuracy from this source is not very important.

The value of dilatation of the pupil in facilitating determination of the refraction is quite important. It gives certainty for uncertainty, and so saves repetitions of the subjective tests. It is of especial value in testing with cylindric lenses. The retinal diffusion areas are always much less for a certain amount of astigmatism than for the same amount of hyperopia or myopia. To attain equal exactness for subjective tests, the diameter of the pupil, which determines diffusion caused by a certain amount of ametropia, should be about twice as great for astigmatism as for hyperopia or myopia. We have all experienced the difficulty of determining the amount and meridians of astigmatism in senile eyes with small pupils. Inaccuracy in measuring such eyes is the rule rather than the exception. In many old patients subjective tests are made easier and more accurate by using cocain or eupthalmin to dilate pupils of three millimeters or less in diameter. This is not using a cycloplegic. But when a cycloplegic like atropin has been used, it may happen that the dilatation of the pupil, and consequent increase in diffusion caused by uncorrected ametropia, is the chief assistance rendered by the cycloplegic.

Suspension of eye strain, resulting in lessened irritability of the eye and improved visual acuity, is often an important help to the measurement of ametropia, and may be obtainable most speedily or only by suspension of accommodation by a cycloplegic. Reduction of inflammation is not required in a large proportion of cases, and may be obtainable by rest of the eyes without a cycloplegic. But it is always a desirable effect of the use of a cycloplegic, and in some cases cannot be secured without it. In a good many cases the advantages of such a rest would alone justify the use of a cycloplegic.

The desirable effects of a cycloplegic are to some extent offset by undesirable effects, as follows: (1) The disability for near eye work imposed by cycloplegia. (2) The unpleasant flooding of the eye with light through the mydriasis. (3) The possibility of exciting a glaucomatous outbreak in an eye predisposed to such an attack. (4) The constitutional and local symptoms caused by the cycloplegic.

The disability for near seeing is not without importance. Eyes that have accommodation use it so constantly and unconsciously that with temporary loss of it disagreeable reminders of what has occurred are sure to arise. The condition is one not lightly to be inflicted, if unnecessary. But if it must be endured it may be made to enforce lessons as to the continuous requirements made of the eyes, even when they are said to be "not doing much," and the importance of having them working easily and unconsciously. The disability is reduced to a minimum duration through the use of the briefer cycloplegics, especially homatropin. The period of cycloplegic disability may be regarded as the price paid for a period of ocular rest. A price may be too high even for something very desirable; but things worth having generally are obtainable by paying a price, and by paying more one may get a greater value.

The annoyance by flooding the eye with a light through dilatation of the pupil is proportioned to the sensitiveness of the retina; and in a strained hyperemic or highly irritable eye may be great. It can be largely avoided by the wearing of protective glasses that will reduce the amount of light entering the eye, or by staying in a darkened room. But here, too, the patient may to a large extent be paying the price for a very desirable thing—the lessening of excessive retinal sensibility. It is certain that under cycloplegia photophobia rapidly decreases. The discomforts of strong light contrast are always associated with and usually ascribed to the bright light. So it is often difficult to get the patient to apply the physiologic remedy, by increasing the minimum of light to which the eye is exposed when in use. The enforced exposure to an increased maximum and minimum, with changes not mitigated by pupil reactions, generally leaves the eyes in better condition than it found them.

The danger of exciting an attack of glaucoma by the dilatation of the pupil caused by use of a cycloplegic would be a serious matter, if the accident were not so rare, and if it could not be used to the permanent advantage of the patient. A few ophthalmologists see several cases of the sort. Many others never see a case among the thousands of patients they subject to cycloplegia. I have seen two such cases. One was that of a clinic patient, who came for the first time at the close of a clinic hour, gave a history of eye strain, and, being a woman of under thirty, was given a prescription for duboisin without ophthalmoscopic examination. In the other case there was a clear history of a previous glaucomatous attack, which the physician who instilled homatropin either did not obtain or failed to appreciate the significance of. A careful consideration of the case history and an ophthalmoscopic examination before the use of a cycloplegic, would probably prevent nearly all of these cases. But in cases of the kind that might arise, reasonable care after the use of a cycloplegic will prevent disastrous consequences, or will turn the incident to the advantage of the patient.

There is no reason to believe that glaucoma can be caused by a cycloplegic in an eye not previously prepared for an outbreak of glaucoma, equally liable to occur after exposure to cold, excitement, exhaustion, etc. The earliest possible recognition of this condition is a boon to the patient. If it comes through the use of a cycloplegic, the prompt application of the proper treatment will be a permanent benefit. Only when the physician fails to urge, or the patient refuses, proper treatment, can it be regarded as a misfortune.

myopia, or to health by habitual headaches or nerve strain? How long has it persisted? Have glasses prescribed by others, or glasses prescribed by myself without cycloplegia, failed to give relief? Is the condition an acute one, in which complete rest of the eyes is essential? Can the patient remain under observation, or must the best possible estimate of the ametropia be reached in a few days or a single day? Are the symptoms well explained by the ametropia manifest? How fully do the results of tests without cycloplegia—the ophthalmoscope, ophthalmometer, skiascopy, and the subjective tests—agree with one another? What will be the annoyance or inconvenience to this particular patient entailed by the use of a cycloplegic at this particular time?

There are certain facts that are not allowed of themselves, per se, to decide this question of the use or nonuse of a cycloplegic. They are: The mere age of the patient. Whether the refraction is hyperopic or myopic. Whether or not there is astigmatism (although astigmatism is an important indication for cycloplegia). Not even the presence of possible symptoms of glaucoma, even actual increase of intraocular tension, would alone decide it. In this matter of the use of a cycloplegic there is occasion for carefully considering all the factors that enter into the individual case. There is need not for rigid rules laid down by partisans, but for the ripened conscientious judgment of the scientifically trained physician.

IX.

THE RELATION OF THE MOUTH TO OCULAR DISEASES.*

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In the past much interest has been shown in the relation of the teeth to eye diseases. Focal infection about the mouth unquestionably has played a very important rôle in many pathologic conditions of the eye, as well as inflammation of the joints and endocardium or chronic bacterial intoxications. There also has been much written on the manner in which bacteria, or their toxic products, are transmitted from the oral lesions to the eye.

It is my wish to classify the eye diseases, and present illustrations of the oral lesions which are most likely to produce them. Some attempts will also be made to clear up the hazy impression many of us have had in regard to the manner of transmission to the eye of these injurious dental products.

First, it will be well to note the various eye diseases which have been ascribed to dental disease. They are numerous and occur as keratitis punctata, severe corneal inflammation, corneal ulcer, dendritic keratitis, parenchymatous keratitis, herpes zoster ophthalmicus, neuropathic keratitis, keratoconjunctivitis, episcleritis, conjunctivitis, lacrimal disease, scleritis, iritis, iridocyclitis, mydriasis, myosis and disturbances of accommodation, choroiditis and disseminated choroiditis, neuroretinal congestion, with lowering of vision, optic neuritis, papillomaculary neuritis with central scotoma, detachment of the retina, panophthalmitis, retrobulbar neuritis, abscess of the orbit, thrombosis of the cavernous sinus, marked temporary disturbance of vision, pain in the eyes and orbit and orbital neuralgia, reflex amblyopia with peripheral contraction of visual fields, paralysis of the oculomotor nerve, hysteric amblyopia and alarming redness of the conjunctiva with vasodilatation after operating procedures on the eye.

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*Read for the author by Dr. T. E. Carmody at the Second Colorado Ophthalmological Congress, held at Denver, Colorado, August 1 and 2, 1916.

With so large a list of eye diseases reported, with the teeth and mouth as their causative agents, it is the duty of every oculist to familiarize himself with oral lesions and to a measure superintend their treatment. This is not always easy, for our training in this field has been limited; but with a little study and patience in examining the mouth, it will be relatively easy to recognize many abnormal conditions. The greatest asset to the study of many obscure lesions, which I believe are very frequently the cause of the diseases under discussion, is the X-ray. To the modern competent dentist the X-ray is almost indispensable. With this aid we can diagnose the fistulous and blind alveolar abscesses, imperfectly filled and septic roots, dental cysts, pulp stones and impacted teeth, all of which might have some influence on an obscure ocular lesion.

Eye diseases are produced secondarily to the mouth in one of three ways. First, by bacteria or their toxins; secondly, by reflex irritation; and thirdly, by combination of both. In the first instance some localized area of infection in the mouth will be the underlying cause. It can be pyorrhea alveolaris, or Riggs' disease, alveolar abscess, either blind or with a fistulous opening, discharging a portion of its contents into the mouth, decayed teeth, periapical abscess, infected root canals, poorly adjusted crowns or bridges, and fillings with overhanging infected margins. In the second class are included impacted teeth, pulp stones, dental cysts, sensitive decayed teeth, broken (broaches), or other foreign material which have been introduced accidentally into the roots, bone, or soft tissue by dentists.

All the above conditions can be roughly diagnosed by the oculist with the assistance of a skilled dental radiologist. Pyorrhea alveolaris is characterized by congestion of the gums which bleed freely on manipulation; in more advanced cases there is looseness of the teeth, retraction of the gingival margin from the tooth, and pus can readily be squeezed from the pyorrheal pockets. These teeth in unclean mouths have large deposits of discolored tartar on their surface. Alveolar abscesses, when draining through a fistulous opening, are very easily diagnosed and their extent can readily be determined by radiograph. Blind abscesses are more difficult. The X-ray of course will in this condition be the determining factor. Diseased teeth are diagnosed by their sensitiveness to heat and cold and tenderness to percussion. Large cavities are easily diagnosed, but smaller ones necessitate the assistance of the dentist with his delicate explorers. Periapical and root canal infection are diagnosed by the use of the X-ray. Crowns and bridges that are surrounded by inflamed gums and hard to clean, having large collections of food, if not pus, around them, should be inspected and remedied by a good dentist. The position of impacted teeth is easily diagnosed by the X-ray, after one has found that all teeth have not erupted. Pulp stones can easily be diagnosed by the X-ray pictures. Dental cysts, if large

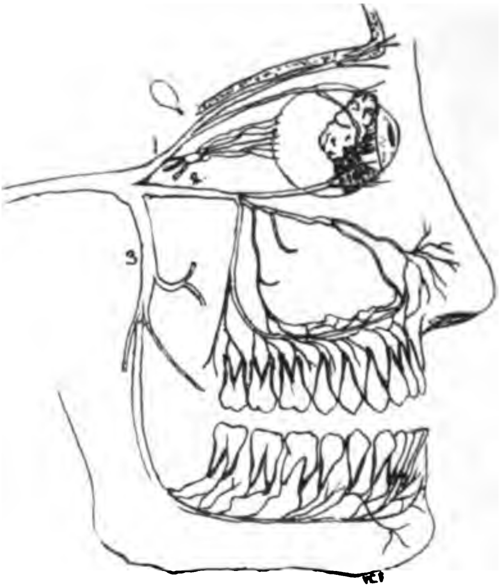

FIGURE 1.

enough, will produce distortion of the mouth, and again the X-ray will tell their size and position. Foreign bodies can easily be diagnosed by the X-ray.

The mechanism of secondary involvement of the eye is of much interest, and many theories have been advanced to explain it. Lelongt thought that suppuration of the lids and lacrimal sac extended through canals in the bone, subperiosteal tissue or lymphatics. Polet gives as the course of extension venous, osseous, subperiosteal canals and along the nerves.

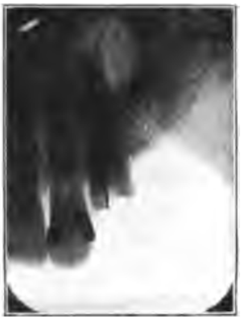

FIGURE 2.

Socalled blind abscess of upper right cuspid, showing wire through root into abscess cavity.

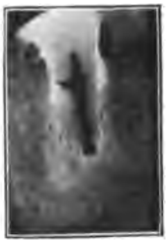

FIGURE 3.

Abscessed root.

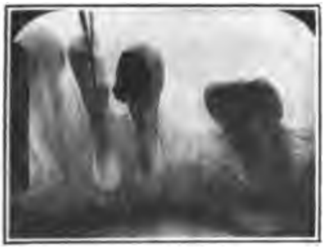

FIGURE 4.

Abscessed roots.

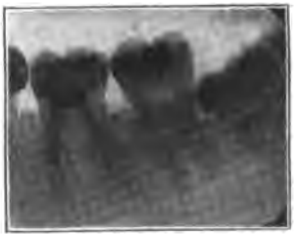

FIGURE 5.

Impaction of third molar.

Dutoit believes that infection can be carried from the dental alveolus through the alveolar plexus to the pterygoid plexus into the ophthalmic vein and cavernous sinus. The only possible modus of deep seated eye inflammation infected from the mouth lesions is hematogenous, for the lymphatics of the mouth drain into the mandibular and cervical glands. Extension along the perineural spaces is improbable. Extension through the periosteal and osseous channels, if it ever occurs, is very rare. A direct extension through the venous channels from the diseased area to the cavernous sinus is anatomically possible, and unquestionably has produced a sinus thrombosis and its symptoms. This, of course, is carried directly through the blood, and could be spoken of as direct hematogenous extension, whereas most ocular inflammations are produced by indirect metastasis, the infecting agent traveling through the general arterial circulation and ultimately infecting the eye.

Pyorrhea alveolaris, with its large areas of infection and, in later stages, with deep seated pockets, which drain with difficulty, is probably the most frequent underlying oral cause of inflammatory ocular lesions. Blind abscesses, which do not drain their contents into the mouth, are splendid sources of chronic hematogenous infection, and probably rank second; while abscesses with small fistulous openings drain with difficulty and are more dangerous than those with larger openings, which drain their whole contents easily. Septic roots and periapical abscesses, if not draining easily, are sources of infection as often as alveolar abscesses with fistulous openings. Infection around poorly adjusted bridges and fillings with overhanging margins probably are not of as much import, but they are sources of infection, and should be looked for and corrected if found.

We now ask ourselves why organisms and their products, located in the mouth, should enter the general circulation, lodge in the eye, and produce the inflammatory changes which we have noted above. This, I think, can readily be explained by the socalled selective action of bacteria located in various lesions for certain tissues. This was first pointed out by Rosenow, and later by Brown and his coworkers. Rosenow found that streptococci obtained from the appendix most often produced lesions in that organ in animals into which they have been injected. He also found that streptococci isolated from arthritis, more often affected the eye than those isolated in gastric and duodenal ulcers, appendicitis and cholecystitis. It is an established fact that the mouth is frequently the underlying cause of arthritis and endocarditis. Now, in Rosenow's experience, we noted that organisms from the joint showed a selective affinity for the eye. Does it not seem reasonable to suppose that the strains of streptococci, staphylococci, pneumococci, and other organisms which have made the mouth their habitat for a long period of time, could be so altered as to possess selective affinity for the tissues of the eye, and, when they or their toxins are floating free in the blood stream, should produce disease in the tissue for which they have an affinity? That the selective tissues of mouth organisms, as was shown by different observers in animal experiments, were most often the joints, endocardium and eye, agrees with the foregoing.

Eye diseases which are supposedly secondary to the mouth in persons having suppurating nasal sinuses, either primary or secondary to the teeth, cannot be expected to show marked improvement by treating the mouth alone, but attention must be directed to the nose as well. The removal of a diseased tooth which has affected an antrum does not necessarily cure the diseased antrum; more radical treatment will be necessary to promote proper drainage. If this is not carried out, a chronic suppurating area is present, which probably has the same pyogenic organisms as were present around the teeth. These organisms could continue to prolong the ocular condition after the teeth have been removed. The second classification, disease reflexly produced from the mouth, is easily understood after studying figure 1, which shows the branches of the trigeminal nerve. The ophthalmic or first branch is the sensory nerve to eye and orbit. The alveolar branches of the maxillary or second division of this nerve are the sensory nerves of the upper teeth, and the third or mandibular branch through the inferior alveolar nerve, carry the sensations from the lower teeth and jaw. This close communication of the sensory nerve readily explains the reflex pains and socalled neuralgia of the eye and orbit, produced by impacted teeth, pulp stones, and other conditions enumerated above. Correction of the cause of irritation is the only hope for a cure of these distressing reflex symptoms.

In conclusion, it will be well to tabulate the various mouth conditions in one column with the eye conditions which they produce, in another. They are as follows:

INFLAMMATORY.

Mouth.	*Eye.*
Pyorrhea alveolaris.	Keratitis.
Alveolar abscesses.	Corneal ulcer.
Periapical infection.	Conjunctivitis.
Root infection.	Herpes zoster ophthalmicus.
Infection around crowns and fillings.	Iritis and iridocyclitis.
	Choroiditis.
	Optic neuritis.
	Retrobulbar neuritis.
	Episcleritis and scleritis.
	Panophthalmitis.
	Abscess of orbit.
	Thrombosis of cavernous sinus.
	Inflammatory postoperative complications.

REFLEX.

Mouth.	*Eye.*
Impacted teeth.	Pain in orbit and orbital neuralgia.
Pulp stones.	Mydriasis and myosis.
Foreign bodies in bone or soft tissue.	Hysteric amblyopia.
Sensitive decayed teeth.	Possibly the socalled neuropathic keratitis.

X.

SOME PERSONAL EXPERIENCES WHICH HAVE STOOD THE TEST OF TIME.*

MELVILLE BLACK, M. D., F. A. C. S.,

PROFESSOR OPHTHALMOLOGY, MEDICAL DEPARTMENT OF THE
UNIVERSITY OF COLORADO, ETC.,

DENVER.

Twenty-five years of work in ophthalmology should make it possible for one to relate a few experiences of his own that might be helpful to others. In time we all come to depend upon certain methods which have stood the test of repeated trial.

It is my nature to be skeptical about therapeutic measures. I cannot help but wonder what would have happened had the remedy not been used. There are few of us who use the same things, and yet we all get results. After all, we must conclude that our general principles are the same and that our medication only assists nature to effect a cure.

There is one remedy I have great respect for, and that is zinc. I use it in the form of the sulphat, and dissolve it in a saturated solution of boric acid in the proportion of one grain to the ounce. Frequent use of this wash brings results. In acute conjunctivitis it should be used in an eye-cup every hour for the first day or so, and then less frequently until the disease is cured.

When a foreign body has been imbedded in the cornea long enough to cause softening of the surrounding epithelium, or when it has burned itself into the cornea, or has made a discolored spot, the simple removal of the foreign body is not sufficient; the softened, burned or discolored area must also be removed by curettement. It is my practice to then fill the eye with 1/3,000 bichlorid salve and close the eye with gauze and adhesive plaster. In my opinion, whenever the epithelium has been seriously disturbed by the foreign body, or its removal, the eye should be closed until the damaged spot has healed. I have long since become convinced that this is highly important.

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*Read at the Second Colorado Ophthalmological Congress, held at Denver, Colorado, August 1 and 2, 1916.

Fluorescin as a staining agent for all kinds of corneal abrasions is most valuable as a sure means of diagnosis, as well as the only sure method of determining the progress of a corneal ulcer, or when the part is healed. The solution I use is made up by dissolving eight grains of fluorescin in one dram of liquor potassium, and distilled water added to make one ounce. One drop of this is instilled into the eye, and then all of it is washed out with salt solution; the raw surface now stands out brightly stained a light green. If a foreign body spot continues to stain at the end of the second day, I replace the adhesive dressing by an eye-patch. The patient is directed to remove this every hour and drop in the eye a twenty-five per cent solution argyrol or silvol. This ocular antiseptic gives nature's forces a better chance to control the infection.

The subconjunctival injection of cyanid of mercury I have come to depend upon in all severe infections of the cornea, iris and ciliary body. The strength varies from 1 to 1500 to 1 to 3000, depending upon the activity of the infection. The dose should be twenty-five minims. If one-third grain of novocain is dissolved in the dose the injection is almost painless, nor does very much discomfort follow. Some disfavor has fallen upon this very valuable remedy because it has not been properly used. Some men use it in doses of five or ten minims, and repeat it every few days, and then condemn it because it apparently does no good.

A remedy which has served to reduce quickly all inflammatory conditions of the conjunctiva is iodid of silver. It is an agent quickly reduced by light into oxid of silver, hence it must be freshly prepared each time it is used, but the results obtained from it have repaid me for this extra trouble. One ounce of a twenty-five per cent solution of nitrate of silver in a seventy-five per cent glycerin solution is kept in a dropper bottle, and a twenty-five per cent solution of iodid of potassium in the same strength of glycerin solution is kept in another bottle. Two drops of the silver solution and four drops of the iodid of potassium solution are rapidly mixed together on some small receptacle like a watch crystal, with a cotton-wound toothpick, and the mixture applied at once to the everted conjunctiva. It produces a sharp smarting for a few seconds, which is largely from the glycerin, but after the tears have escaped by forcing the lids apart it is all over, and the patient opens his eyes and goes about his business.

A number of years ago Tiemann & Company made for me a probe pointed cataract knife. I have found it a most convenient instrument, not only as a secondary knife in cataract extraction, but for other things. The sharp point on a cataract knife is frequently a nuisance. In removing the head of a pterygium from the cornea I like to shave it off with a sharp knife, and if there is opaque tissue still left, to scrape it off until clear cornea is reached. This blunt ended knife is most convenient for both purposes. Whenever it is desirable to enlarge any knife wound, it is so much easier to insert into the wound a probe pointed knife than a sharp pointed one.

Several years ago I read a paper before the section of ophthalmology of the American Medical Association, on blanching the retinal vessels by making pressure on the eyeball with the finger.[1] The effect of this pressure is observed with the ophthalmoscope. I have found this test most valuable, and use it constantly when making an ophthalmoscopic examination of the fundus in each case of refraction. It is surprising how often my suspicions are aroused that high blood pressure is present, and am able to verify them by the sphygmomanometer. If this test becomes a habit, it is possible to tell with great accuracy whether there is more resistance in the retinal vessels to pressure upon the eye than there should be. This cannot help but lead to the detection of beginning high blood pressure in many comparatively young people. At a time, too, when much can be done. I do not believe that this test is being used by many men, and I feel that it is worthy of more universal use.

REFERENCE.

1. **Black, Melville: An Index to the General Blood Pressure. Jour. Am. Med. Asso., July 29, 1911.**

XI.

TUBERCLE OF THE CONJUNCTIVA.*

JAMES ALLEN PATTERSON, M. D.,

COLORADO SPRINGS.

I beg to present a case of tubercle of the conjunctiva with this beautiful water color picture painted by Miss Leaming, an artist of this city. The patient being bedridden, I am unable to present her in person.

HISTORY.

Mrs. F., aged fifty-seven years, was seen on July 29, 1916. She came here for lung tuberculosis, but did not consult a physician until she had spent five days walking around and was then compelled to go to bed and call one.

The patient gives a history of having had tuberculosis two years previous to a relapse which began in June, 1914, having been induced by an attack of influenza, then prevalent as an epidemic. On August 5, 1915, she became an inmate of the State Sanitarium for Tuberculosis of Iowa. She returned to her home in Iowa, February 5, 1916, where she endeavored to continue out-of-door treatment.

Dr. W. H. Swan, through whose courtesy I saw the case, found the patient dropsical, which had been noticed for seven weeks, the urine showing albumin and blood casts. He tells me there is rather extensive tubercular infiltration in the left lung; the right lung is involved, but to a less degree. The patient has had marked elevation in tempearture for many weeks.

Upon everting the lid of the right eye I found a large round ulcer three millimeters from the edge, and another one, of linear shape, below and slightly outward from the first, located

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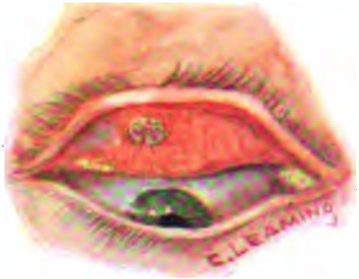
*Read at the meeting of the Colorado Ophthalmological Society, at Colorado Springs, Colorado, October, 1916.


E. LEAMING

exactly upon the fold of the everted lid. The round ulcer had deep, undermined edges, the center being gray and somewhat speckled. The center was depressed, giving a slightly umbilicated appearance. The linear shaped ulcer was narrow, with equally steep undermined edges, the center being the same gray color. A small quantity of mucopus was daily secreted and would accumulate at the inner canthus, as shown in the picture. The patient removed this with her handkerchief many times during the day. The bulbar conjunctiva has shown barely any congestion, nor has there been much congestion surrounding the ulcers. No involvement of the lymphatic glands could be found in the facial or cervical regions. The larynx was free from tubercular invasion, but there was some catarrhal condition in both the larynx and trachea.

The patient first noticed that the right eye was uncomfortable last March. The two ulcers were noticed by her medical attendant before she came here. A collyrium of boracic acid has been the only treatment prescribed.

On August 3d both of the ulcers were thoroughly curetted and cauterized with a saturated solution of trichloracetic acid. This was done very cautiously, but deeply. A strong solution of bicarbonate of sodium was immediately used around the ulcer so that no excess could do damage to normal tissue. The result has been an absolute cure, nevertheless the scars of the original ulcers can still be distinctly seen. The mucopurulent secretion which was present immediately ceased.

The best description of tubercle of the conjunctiva I find in the last edition of de Schweinitz's textbook, being Sattler's classification, as follows: The disease may appear in one or other of the following manifestations:

1. One or more miliary ulcers, which usually caseate. The ulcers have uneven and slightly raised edges, and their floors have a yellow or sometimes a lardaceous appearance.
2. Grayish or yellowish subconjunctival nodules which resemble the sago granules of trachoma.
3. Florid hypertrophied papillæ, and rounded, flattened outgrowths of granulation tissue.
4. Numerous pedunculated cock'scomb excrescences.
5. A distinctly pediculated tumor.

This case seemingly comes under the first classification.

Various cases are gathered in Jackson's Year Book, particularly for 1904, 1906 and 1907, but they are of such varied characteristics that one is inclined to conclude that it is a disease of many variations in appearances; however, when the tarsal conjunctiva is involved there seems to be a greater tendency to ulcer formation, which, as described, may or may not coalescence.

Kalt (Y. B. 1903) reports two cases in which "long bands of cicatricial tissue were seen running between the lids and the globe. The skin in the prelacrimal area was as white as in lupus."

Many of us recall Jackson's case involving the lid, which was exhibited to this society in 1903 and illustrated in the *Ophthalmic Record* for September, 1903. Subsequently, Libby showed a case in which the bulbar conjunctiva was the site of the lesion. The majority of cases reported have been seen in children and young adults, although Libby's case was forty years old, and Shoemaker's thirty-nine years old. One has been recorded at the age of seventy-one.

Until comparatively recent years tuberculosis of the eye in its many forms, seems to have been confused with other diseases rather than properly diagnosed. Concerning the diagnosis of my case, I had some suspicion that the ulcers might be caused by the fusiform bacilli and spirilla of Vincent, but, although thorough search for them and for the tubercle bacilli was made from the scrapings of the ulcer, none were found. I diligently searched for some involvement of the lymphatic glands. Their escape from infection is no doubt due to the sluggish character of this particular case.

XII.

THE USE OF EYES OF KITTENS IN OPHTHALMIC OPERATIVE TEACHING.*

W. A. Fisher, M. D.,

PROFESSOR OF OPHTHALMOLOGY, CHICAGO EYE, EAR, NOSE AND THROAT COLLEGE,

Chicago.

Teaching institutions do not encounter any great difficulty in the instruction of nose and throat operative technic, sufficient clinical material always being available, and the procedures usually being of such nature as to make it possible for a novice to undertake them, under the direction of a capable assistant, after sufficient preliminary reading and instruction. Such, however, has not been the case in the matter of ophthalmic operative teaching. To begin with, there is not a great deal of ophthalmic surgery to be done, and the majority of the procedures are so pregnant with such grave possibilities as to preclude their being entrusted to one who has not had experience.

Clearly, this experience must be gained on the eyes of the lower animals, but up to the present time no great amount of useful work has been reported in this field. Sheep's eyes have been used for practice in muscle operations, and those of the pig for operations upon the eyeball; but neither are satisfactory. In the sheep the capsule of Tenon is so poorly differentiated and so many accessory tendonous attachments are encountered, as to make the work atypical. As obtained commercially pig's eyes are delivered enucleated, thus precluding practice upon muscles; and, since they have such a large and thick cornea, are quite impractical for corneal work. The iris, tóo, is so thick that operations upon it are likewise very unsatisfactory.

Dissatisfaction with the use of the above, and realization of the need of something better—the use of an eye more nearly approaching the condition obtaining in the human—has induced me to conduct a series of experiments in an effort to find a more satisfactory substitute. Since the greater portion of ophthalmic surgery is concerned with the cornea or iris alone or combined, my efforts have been directed to finding material in which these structures are analogous to those of the human, and have included practically every available small or domestic animal.

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*Read before the Chicago Ophthalmological Society, October 16, 1916.

The eyes of guinea pigs were rejected because of the small size of the cornea even in well-grown specimens. Those of the rabbit are nearly like that of the human in point of texture, but the anterior chamber is so shallow that it is quite impossible to make the incision for iridectomies or cataract operations. The eyes of domestic fowls were rejected because of the cartilaginous character of the limbus, which effectually prevents proper puncture and counter puncture, and makes it impossible to express the lens by means of pressure.

For muscle work the eyes of the dog were found far superior to those of the sheep, because of the well-marked Tenon's capsule and the character of the tendons, which are the same as the human eye. It is necessary, however, to select the eyes of well-grown animals to find muscles of a size comparable to those in the human subject. This, as in the sheep, results in the selection of material in which the cornea is too large and dense for satisfactory work upon the globe.

For work upon the eyeball proper, the eyes of kittens were found so far superior for all purposes to all the others mentioned, that once used they will never be discarded. The reason for this lies in the fact that while, as in other lower animals, the ratio of diameter of cornea to size of the eye is greater than in the human, by proper selection specimens may be readily obtained in which the size and thickness of cornea, depth of anterior chamber and texture of iris—the important points of this work—are analogous in every respect to those of the human eye. To meet these conditions one should use the eyes of kittens from four to five weeks old and weighing about twenty-four ounces.

The question of the availability of material is not at all pertinent, because no difficulty need be experienced, even in our larger cities, in procuring it regularly in quantity and at really very small expense.

TECHNIC.

The following has been found to be a good working plan: The kittens should be killed before beginning work, after having been dusted lightly with powdered naphthalen, to dispose of any vermin present. The killing may be most conveniently and cheaply done by the injection of one-half grain of strychnin sulphate intrapleurally. Cut away the lids and nictitating membrane, which interfere and the absence of which does not impair the work in the least, then do tenotomies on the recti muscles, and finally, since the eye, because of its deep set position, must be removed and placed in a mask for cataract work, enucleate by any of the methods advised.

The eye should now be fixed in a suitable mask, which can be easily improvised from a deep cigar box. The bottom of the cigar box being too thin, the lid is removed and fastened securely to the bottom by means of glue or nails. Locate two points on the reinforced bottom three-fourths inch from either side and one and one-half inches from one end. At these points burn holes with an ordinary hot poker not to exceed one-quarter inch in diameter, and cautiously enlarge them to one-half inch, taking care not to burn too deeply into the wood.

Strive to make a concavity in which to have the eye rest snugly, and at the same time have enough of the bottom of the box behind it to prevent its drawing through when fixed in position. Drill two more holes near the free edges of the box, opposite those in the bottom, large enough to accommodate any small wooden cylindrical rod—a lead pencil does nicely. Slot one of the holes and make a key to fit the slot snugly that when pressed home it will prevent the pencils turning. Flatten one or two sides of the pencil, and the mask is ready for use as follows:

Pass a strong sufficiently long thread into the scleral tissue near the optic nerve, and drop the ends through one of the bottom holes, either right or left, as may be desired. Make one or two overlapping retaining turns over the flattened pencil, and then continue turning until the eye is drawn snugly into the cup made for it at just the proper tension, as determined by the tonometer.

A new mask I have devised for this special work, with which the eye is similarly secured and maintained at the proper tension with less trouble in passing the thread, as described with the mask made from the cigar box, has some advantages.

With the eye thus fixed the regular cataract procedures may be taken up in order, viz., incision, iridectomy, by any of the described methods; capsulotomy with cystotome or capsule forceps, if practice in the classical method of extraction is desired; lens extraction in capsule, and finally replacement of the iris and toilet of the corneal wound.

We must admit that experience is our greatest teacher in this operation, but that material is practically impossible. Eyes are too precious for teachers to allow students to operate, hence the only chance one has to acquire experience in this delicate surgery is to witness operations.

If a student could have an opportunity to operate for cataract upon one hundred eyes, and this experience could be obtained in a short time, he could acquire quite a good technic; but this experience extending over many years, as is usually the case, by the time one has acquired a reasonably safe technic he is loth to change or take up another method. If then one will operate upon a sufficient number of kitten's eyes to get a technic, he can remove lenses in capsule quite as well as by the old method. A trial of the method will convince any one of its efficacy.

There are probably but few operators who would not accept the intracapsular operation, providing they could have enough experience to master that technic. A good incision is imperative, whatever method is selected, for a cataract operation, and this can be mastered providing enough material is used. In addition to the above, all of the operations upon the eyeball that are described in the textbooks may be performed on these eyes precisely as they would be in the human subject, with or without preliminary enucleation, as the student may elect.

The reason that ophthalmic surgery is generally considered difficult, lies in the fact that all save our most experienced operators approach a given case with a feeling of unpreparedness and uncertainty, resulting from a lack of the coordination of brain and hand that can come only from operating many times.

With the material described, however, this need not be the case, for in a comparatively short time, which is a distinct advantage in acquiring technic, any student can with, one hundred kittens do as much operative work as the busiest oculist in many years. One hundred kittens (two hundred eyes) will furnish material for four hundred muscle operations, two hundred enucleations, two hundred iridectomies, and two hundred cataract extractions, making in all one thousand operations. If the student uses this, or twice this, amount of material, he cannot fail to bring to his operating room an experience and confidence that can be secured in no other way.

WHEN AND HOW SHOULD A CATARACT OPERATION BE PERFORMED.

The majority of the world's ophthalmic surgeons would say to the patient, wait till you are blind or the cataract is mature, and have the operation that is practiced by most ophthalmic surgeons.

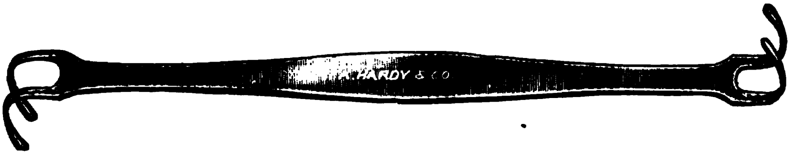

FIGURE 1.

Author's upper lid hook.

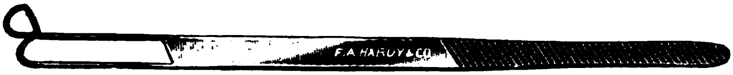

FIGURE 2.

Author's lower lid hook.

It is a serious matter to advise a patient with immature cataract to delay the operation, when his adviser knows this advice would not be given if he had material enough to master the intracapsular technic. Smith of India states that when the lens becomes so opaque that vision is no longer useful for ordinary practical purposes, it should be extracted in capsule.

Ophthalmic surgeons the world over would give the same opinion, if they could remove lenses as Smith does, and the only excuse is the want of material to operate upon.

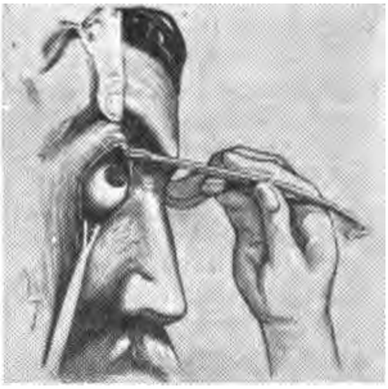

FIGURE 3.

Author's double lid hook, holding the upper lid away from the eye, keeping all pressure from the globe, the assistant's fingers resting upon the patient's nose. The thumb or left hand holding the lower lid down, a second assistant or nurse holding the brow up. The assistant holding the lid hooks stands at the left side of the patient when operating upon either eye.

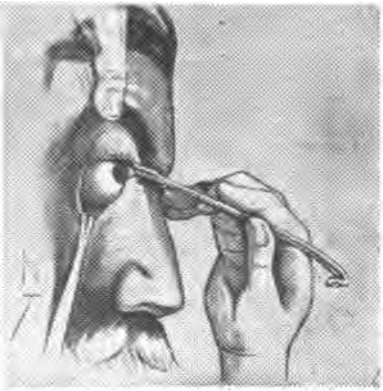

FIGURE 4.

The same as No. 3, except the double hook is pulling the lid forward or down to take off all pressure in impending or actual loss of vitreous, the double hook being depressed to keep from slipping out from under the lid.

Removing a lens by any method is a delicate procedure, and requires much experience to become proficient. Whichever method the operator receives his experience in is the one he is familiar with, and when he has operated about fifty or more times he is loth to change from the method he feels that he has mastered.

Cataract operations by any method, performed by fair operators, upon patients commonly called good are usually successful, and those that are failures would usually have been successful providing no accident or complication had occurred. Accidents and complications must then be emphasized more than the method of operating, and the method of operating should be selected that will give the best general visual results, and the complications common to this method emphasized.

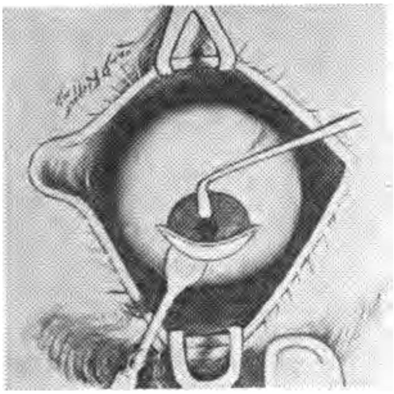

FIGURE 5.

Smith's method, with author's modification of operating when vitreous precedes lens delivery. If loss of vitreous preceding lens delivery has occurred in the intracapsular operation, the lens is delivered by the Smith method with the lids held away from the globe by author's retractors, the same as in the beginning of the operation. Pressure of the hook is removed, the Smith spoon (Fig. 7) is passed down behind the lens and pressure is then made to slide up the spoon and out.

If the lens is successfully removed in capsule, inflammation is rare, and it is not necessary to make a secondary operation upon the capsule. If this method can be successfully mastered, these advantages, together with the fact that the operation can be performed at any stage of opacity, is surely worth consideration.

The great objection to the intracapsular cataract operation seems to be the loss of vitreous. This complication is recognized as serious when operating by any method, but when it occurs before the lens is delivered, it is more serious because the lens must be delivered, and this cannot be accomplished by pressure upon the cornea; and if the lens is delivered with a wire loop passed into the vitreous, the complication is very grave. This accident must be emphasized and if possible a method of taking care of it devised.

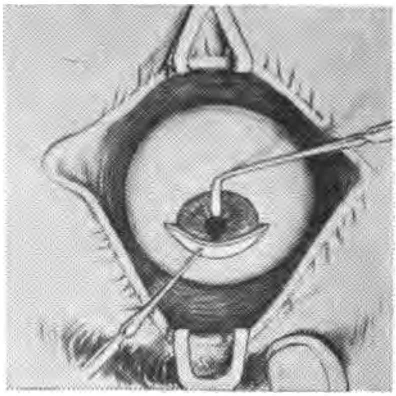

FIGURE 6.

Author's method of operating when vitreous precedes lens delivery. Loss of vitreous preceding lens delivery has occurred in the intracapsular operation, the lids are being held away from the globe by author's lid hooks, the same as when the operation began. The author's needle (Fig. 7), which was held in the left hand waiting for such an accident, is stuck into the edge of the lens, and, with just a little pull upward, together with slight pressure upon the cornea with the hook, the lens either comes out in capsule or the capsule ruptures.

To avoid complications the operator should familiarize himself with the hooks, not upon cataract patients, but upon any one with the eye anesthetized by holocain. If the lids are mastered in this manner by the operator, he will have little trouble in instructing an assistant or nurse. The one thing necessary for proficiency is enough practice upon human eyes.

When operating by any method the lids must be held away from the eyeball, and this is best done by the lid hooks I have devised, shown in Figures 1 and 2, in the manner described in Figures 3 and 4, or those devised by Dr. Derrick T. Vail.

LOSS OF VITREOUS PRECEDING LENS DELIVERY.

This complication is a serious one unless handled in a proper manner. Figure 5 represents Smith's method of removing the lens when the intracapsular operation is being performed and a loss of vitreous is imminent or has actually occurred.

Delivery of the lens by the intracapsular method cannot be successfully demonstrated upon kitten's eyes, because the animal is too young, but experience can be obtained in the use of the Smith spoon and the author's needle. If this method is emphasized and plenty of kittens sacrificed, the complication that seems to keep the intracapsular operation from being accepted will not be as serious as it now appears. Many operators have attempted the intracapsular operation with this experience and have failed.

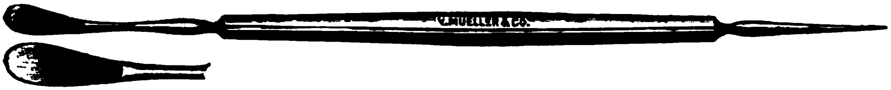

FIGURE 7.

Smith-Fisher Instrument.

The technic of the cataract operation as described will spell success, no matter what method is selected. It seems strange that many operators of large experience advise mastering the capsulotomy method and operating not less than one hundred times before taking up the intracapsular operation, when emphasis should be given the complications of cataract operations by any method.

HOW TO PROCEED TO DELIVER A LENS.

When an operator can make a good incision upon the kitten's eyes, has mastered the lid hooks upon human eyes, Smith spoon and author's needle upon kitten's eyes, he begins the operation by making as good an incision as he can, makes the best iridectomy he can, and instead of cutting the capsule, he proceeds to remove the lens by the intracapsular method, holding the needle in position as described in Figure 6, ready to stick into the lens if it refuses to be born, after he has made pressure he considers safe, or if vitreous loss seems imminent, or if it has actually escaped. The spoon is reserved for any case when the lens slips back into the eye, preventing the use of the needle. The more expert the operator, the less use he will have for the spoon or needle.

Some capsules will rupture when the needle is used, but most operators would prefer a secondary needling to a loss of vitreous.

AFTER-TREATMENT OF CATARACT.

If the lens is removed in its capsule, inflammation is rare, and the daily treatment recommended after the capsulotomy method is omitted. The bandage can be changed the fourth day and a new one applied, but the lids should not be opened, and this bandage should not be disturbed, for five days more, unless the patient complains. Nine days after the operation the corneal wound is usually closed, the anterior chamber reformed, the bandage is omitted and the patient is given smoked glasses. If a prolapse of the iris is found at the first inspection, nine days after the operation, the eye is rebandaged for four more days, at which time the prolapse iris is cut off.

After a cataract operation the patient should be put to bed and kept there twenty-four hours, after which he can be up and down, as is most comfortable, advising him that the bed is the best place for the first week. Daily inspection of the eyes is unnecessary and often harmful.

CONCLUSIONS.

1. Master the lid hooks and teach an assistant by practice upon human eyes, using Smith spoon and author's needle upon kitten's eyes, before beginning a cataract operation by any method.
2. Students cannot become competent to do surgical operations upon the eye by watching others.

3. The eyes of kittens four weeks old are better for teaching ophthalmic surgery than are those of other animals.

4. Any student who has prepared himself for ophthalmology can get an operative technic in this manner not equaled by any other.

Mask made by V. Mueller & Company.

XIII.

A CORRECTION.

E. L. JONES, M. D.,

CUMBERLAND, MD.

The concluding sentences in a paper published in the ANNALS for April, 1916, page 288, are: "It is said that the elder Critchett was wont to facetiously remark he could not sleep well at night if he had not removed an eye that day. Had he known of, and practiced massive subconjunctival injections up to its capabilities, he would no doubt have spent many a restless night."

A copy of this pamphlet was sent to Sir Anderson Critchett with a letter saying that it might interest him inasmuch as the liberty had been taken to quote his father, whether rightly or wrongly, I did not know. In time the following reply was received:

"21 Harley St., London, W.,
"5th September, 1916.

"DEAR DR. JONES:

"I thank you for your letter, and for the two interesting pamphlets which you have kindly forwarded. Rumour had not brought you quite the correct story about my father, and you may perhaps like to know from me how it originally started. About seventy years ago the method of removing an eyeball was so brutal, unsurgical, and destructive, that it was only resorted to in very extreme cases, so that many eyes which had better have been removed were allowed to take their chance. When my father discovered the plan of dividing the muscles in turn, and leaving a stump for the artificial eye, the operation was so simple and safe that he and his colleagues at once proceeded to enucleate a large number of eyes which badly needed the operation, and this, of course, so altered the statistics of the operations at Moorfield's Hospital that the fact attracted the attention of many Continental surgeons, and amongst them that of Dr. Warlomont, who for many years ably edited *Les Annales d'Oculistique.* On his next visit to London he could not resist saying to my father:

" 'On dit que si vous et Monsieur Bowman ne pouvez pas faire l'operation de l'extirpation du globe chaque jour vous ne dormez pas bien!'*

"What you suggest in your pamphlet could never have emanated from my parent, because he always regarded the removal of an eye as an act of destruction, and, to some extent, as a matter of reproach; so I dare say you will kindly put this little matter right in any new edition of your pamphlet. * * * * Believe me,

"Sincerely yours,

"ANDERSON CRITCHETT."

***"They say that if you and Mr. Bowman cannot perform the operation of extirpation of the eyeball every day, you don't sleep well."**

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

BY

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DETROIT.

WM. EVANS BRUNER, M. D.,

CLEVELAND.

EDGAR S. THOMSON, M. D.,

NEW YORK.

NELSON M. BLACK, M. D.,

MILWAUKEE.

EDWARD C. ELLETT, M. D.,

MEMPHIS.

GEORGE S. DERBY, M. D.,

BOSTON.

Notes of Some War Wounds of the Eye and Orbit.

CUNNINGHAM, J. F. (*Ophthalmoscope*, August, 1916), contributes his notes taken from cases seen since April, 1915, at the eye department of a stationary hospital.

Three cases are cited as instances of foreign bodies of an unusual nature.

Case 1.—Deeply imbedded in the cornea, below and out from center, was a pieec of bone about the size of a millet seed, which had belonged to a neighbor who was also wounded. The fragment was removed with Beers knife.

Case 2.—As result of a cordite explosion, a fragment of cordite was imbedded in the cornea, almost into the anterior chamber. It was removed with Beers knife and forceps. The left eye was so badly injured excision was necessary.

Case 3.—Following an explosion a number of small golden grains were found on the surface of the iris and lens capsule, and on the back of the cornea. There was a small perforation at the limbus below, through which the foreign bodies had entered. The foreign bodies were believed to be trinitrotoluol.

Intraocular foreign bodies, magnetic and nonmagnetic, fall into two classes, according to their position:

(1) Those in the anterior chamber or in the lens, where they can be seen on external examination.

(2) Those that are further back, and are either invisible or seen only with the ophthalmoscope.

When the foreign body is lying on the surface of the iris and there is no injury of the lens, the outlook is very satisfactory. Seven such cases were cited.

When the lens has been injured, the outlook is much more serious. The eye may be lost from suppuration or chronic inflammation; the foreign body may become firmly fixed in the lens, a case of which is described; or the lens may soften and may be washed out, as in another case cited.

Of the foreign bodies in the posterior part of the eye, only those that are magnetic may be removed. Some are only slightly magnetic, as the ferronickel, from which the mantle of a German rifle bullet is made. Some may be so firmly fixed in the sclera that they cannot be removed. Cases illustrating these points are briefly described.

As to the risk of foreign bodies in the eye, the statement is made that where there is no uveal prolapse or entanglement of lens capsule, or where a prolapse has been completely removed, it is fairly safe to leave eyes with foreign bodies in them, provided they quiet down. If the inflammation does not subside or the eye is blind, no risk should be run. A too hasty decision as to the uselessness of an eye must be avoided, as several instances were met with of an eye being so badly concussed that it had no perception of light, but a few days later recovered sufficiently to count fingers.

The next case is an instance of a foreign body projecting into the eye posteriorly, and yet in the course of over a year, there have been no signs of degeneration or progressive deterioration of vision. The upper half of the field was defective and vision equaled 6/36.

When there is a foreign body in the eye which cannot be removed, complicated by a prolapse of uveal tissue, and it is decided to see if the eye will quiet down and retain useful sight, it is, of course, extremely important to get rid of the prolapse by drawing out and excising in the case of the iris, or in the case of the ciliary body, replacing or excising, as seems best, combined with careful suturing of the sclerotic. This gives the eye a chance of quieting down with the minimal risk, and if it does so, it allows of any subsequent operation that may be deemed necessary to improve vision.

If the sclera is not sutured, it is liable to be followed by a prolapse of the ciliary body at that critical time when the fate of the eye hangs in the balance.

A case is cited in which a uveal prolapse disappeared spontaneously.

Two cases are described of foreign bodies in the fornices of the conjunctival sac, remarkable for their size, without perforating the lid. The first instance was that of a German shrapnel ball in the fornix, the other a piece of shell one centimeter long by one-half centimeter in the other two diameters.

In the case of shell or bullet wounds, if the eye is hit by a large fragment, it is generally ruptured out of all outward recognition. On the other hand, there were several cases in which the eye was intact anteriorly, but had been penetrated by a small fragment behind the reflection of the conjunctiva. Unusual foreign bodies may be driven into the eye by the bursting of a shell, as instanced by the case of an officer, who suffered a large wound of the frontal region. Two pieces of wood, which had formed parts of his "dug-out," were imbedded in the left orbit. The eye was disorganized.

Foreign bodies in the orbit are tolerated extremely well, provided there is no orbital cellulitis due to infection. In the absence of such inflammation, the foreign body should be let alone. Another point of interest is that in cases where a missile has passed through the orbit, causing severe concussion to the orbital tissues, the cornea may lose its sensation and be attacked by neuropathic ulceration, probably due to interference with the ciliary nerves.

How persistent this condition may be is not known. In one case the ulcer healed rapidly without it being necessary to suture the lids, and the sensation of the cornea returned. In another case, it persisted for over two months, when the patient was lost track of.

In the case of bullets passing through the orbit the eye may be compeltely disorganized, with the contents extruded from the sclerotic. The globe is often ruptured, and we have frequently found the entire cornea turned down in the form of a flap as the result of a bullet having passed through the posterior part of the orbit. The eye may occasionally be dislocated forwards, as in a case described, where ruptured both optic nerves were severed by a bullet.

The last case described is one in which a bullet passed through both orbits. The left eye was disorganized and the right eye developed neuropathic ulceration, due to division or possibly concussion of the ciliary nerves in the orbit, necessitating suturing of the lids. W. R. P.

Ophthalmoscopic Work in a British Base Hospital.

Greenwood, Allen (*Ophthalmoscope,* August, 1916), writes of interesting fundus changes observed from day to day while working with the Harvard Surgical Unit in the British Expeditionary Force.

The Fundus in Trench Nephritis.—This is a form of acute nephritis resulting probably from a lessening of the skin elimination produced by standing for days and days in water-soaked clothing, and often up to the waist in water.

These men come into the hospital with a very marked general edema which subsides very rapidly after they are placed in warm beds. Six cases were examined immediately upon admittance. Two showed neuroretinal edema, two optic neuritis, and one slight edema of discs, and one normal fundus.

The five cases showing fundus changes presented very marked general edema, with puffing of the face and eyelids. The sixth case had very little edema, but the urinary examination was in keeping with the others.

These patients were all seen again after six and one-half hours' rest in bed and profound slumber. All of them showed a marked decrease in the fundus changes.

Twelve hours later, in the first two patients the fundi looked normal; the next two showed a slight neuritis; the fifth would ordinarily have passed for a normal fundus, the remains of the edema being so slight; while the sixth was still normal.

Another twelve hours later, after a full night's sleep, there were no signs of any fundus disturbance in any of these cases.

Subsequent cases of "trench nephritis" showed similar fundus changes if seen immediately after admission. In no instance was there the slightest evidence of any degenerative processes, the whole picture being that of an acute nephritis of sudden onset and equally rapid recovery.

The Fundus in Brain Injuries.—Practically all perforating brain injuiries resulted in a more or less extensive meningitis, which was evidenced in the examination of the fundus by an optic neuritis, and where the cranial drainage was poor, with increased cerebral pressure, by a papilledema. So clearly defined were the changes that great dependence was placed upon the fundus examination as an indication for reopening the cranial wounds to reestablish proper drainage. Five cases are briefly cited where the fluctuation in the amount of optic neuritis and choking of the discs were looked upon as indications for, or against, renewed attempts to establish proper intracranial drainage. W. R. P.

The Prognosis of Foreign Bodies in the Eye and Orbit.

CRIDLAND, BERNARD (*Ophthalmoscope,* August, 1916), reviews the cases of foreign bodies in the globe and orbit which have occurred at the Wolverhampton Eye Infirmary during the past thirteen years.

The number of accidents all told, excluding military cases, which have been attended in these thirteen years, is over 43,300, and the number of cases in which a foreign body has entered and remained in the globe is seventy-six, whilst only one case occurred in which a foreign body entered and remained in the orbit.

The percentage of foreign bodies remaining in the eye (0.17 per cent) is astonishingly low.

Of the seventy-six cases, forty-three eyes were saved and thirty-three enucleated, the percentages being respectively 56.5 and 43.5 per cent.

The situations, in the eye, occupied by the various fragments, with the number of cases in each, were as follows, in order of frequency:

	Cases	Per cent	Eyes saved	Eyes lost
Vitreous	36	48.0	12	24
Lens	12	15.	10	2
Posterior scleral wall	11	14.	4	7
Anterior chamber	11	14.	10	1
Anterior scleral wall	3	4.	2	1
Iris	1	1.3	1	....
Posterior chamber	1	1.3	1	....
Orbit (eye also injured)	1	1.3	1	....
	76	99	41	35

The nature of the fragment in the seventy-seven cases was as follows:

Seventy-two cases—steel or iron, the majority being steel. Four cases—pieces of glass, two eyes being enucleated. One case—thorn, eye saved.

The dominating factor in the prognosis as to whether the eye is to be saved or not, is, as might be expected, the occurrence, or otherwise, of sepsis. This may be early, causing panophthalmitis, or late, when the eye passes through the stages of severe iridocyclitis, softens, and finally becomes a useless and painful organ. Added to this is the ever present specter of sympathetic ophthalmitis.

The conclusion is drawn that the vitreous in the place where a foreign body, having entered the eye, most usually comes to rest, and that the chances of the eye being saved in such an event are as one is to two.

The next most dangerous place is the posterior wall of the globe, the chances being a little less than even that the eye is saved, although the occurrence of a foreign body in that situation is distinctly rare.

The best place of all is in the anterior portion of the eye—i. e., the anterior or posterior chambers, the iris or the lens, and of these the lens is the worst; for although good visual results may be obtained, the patient is a one-eyed individual as far as the labor market is concerned, although rather better than that by reason of possessing a potential eye, which would be of value should anything happen to the good eye.

The magnet used in all cases was that devised by Hirschberg, the point being introduced into the vitreous freely if necessary.

The writer concludes from fifteen years' observation of these cases that the fragment must be extracted at almost any cost, for if not the eye is lost, except in those cases where the fragment lies in the posterior scleral wall in an aseptic condition, or in the lens. W. R. P.

Large Traumatic Hemorrhages of the Vitreous.

ORMOND, A. W. (*Ophthalmoscope,* September, 1916), discusses the problem of absorption of blood following vitreous hemorrhages.

The number of cases of injuries to the inner vascular structures of the eye occurring during the present war present a fertile field for study, because the etiologic factor is traumatic, and for the rest only healthy ocular tissues are left to be dealt with. Most vitreous hemorrhages resulting from gunshot wounds, etc., are due to rupture of the retinal vessels, or the vessels of the uveal tract.

In all instances where the pupil was active, treatment was attempted, in some cases with gratifying results. Where the results were disappointing, large ruptures of the choroid and retina were subsequently found to be present.

The steps by which blood is absorbed follow this sequence —first, the fluid part is carried away by the lymphatics and blood vessels; second, the solid constituents are removed by leucocytes, the red blood corpuscles are destroyed and assimilated, the blood pigment being found subsequently in the surrounding tissue and in the lymphatic glands; and, lastly, the fibrinous coagulation remaining is invaded by fibroblasts which gradually convert the residue into fibrous tissue, which by its contraction further diminishes the volume of the exuded mass.

The means used to influence this condition are tabulated as follows: (1) Massage. (2) Ionization. (3) Subconjunctival injections. (4) Removal of some of the fluid and its substitution by normal saline. (5) Fibrolysin. (6) Dionin. (7) Potassium iodid. (8) Radium.

In conclusion the author writes: "Undoubtedly in some instances hemorrhage disappears entirely from the vitreous and from the retina in these traumatic cases; but as every case has been treated in some way or another, it is difficult to be sure how much the result has been affected by the treatment, because in some instances in which the same treatment has been applied, very little improvement has taken place before organization of the blood clot supervened.

"Why some cases should show so much improvement, and others so little, is not, to my mind, quite clear. Whether it is due solely to the quantity of blood, or to the extent of the rupture, or its position, I am uncertain; at the same time I feel convinced that in some of the cases treatment has been beneficial. With the exception of the indirect action of iodin, it is not clear to me that we have any drug, the presence of which undoubtedly benefits absorption; massage, ionization, subconjunctival injections, and dionin owe their beneficial effect entirely, in my opinion, to mechanical causes. The removal of fluid, and its substitution by normal saline and radium are, I think, of very doubtful benefit. Fibrolysin, possibly, by the production of leucocytosis may influence matters; but I think that mechanical treatment is not only the safest, but also the one most hopeful for the future." W. R. P.

Peripheral Lesions of Shell Concussion.

Evans, J. Jameson (*Ophthalmoscope,* September, 1916), reports his notes on fifty cases of defective vision ascribed to "shell shock," out of some four hundred and fifty ophthalmic cases seen at the first and second Birmingham War Hospitals and at the Birmingham and Midland Eye Hospital.

No case of complete blindness, either monocular or binocular, was met with, but amblyopia of varying degrees was found to be a frequent symptom ascribed to the effect of high explosive shells.

The treatment in all cases was by ordinary therapeutic means and no suggestive methods were used.

The cases may be roughly analyzed as follows:

Errors of refraction	13
Corneal lesions; nebulæ	5
Corneal lesions; keratitis or epithelial dystrophia	5
Conjunctivitis	5
Iridodialysis	1
Subluxated lens	1
Choroidal rupture	2
Retina; hole at the macula	2
Retina (?) thrombosis of the central artery	1
Optic nerve; hemorrhage into sheath or nerve	1
Optic nerve atrophy	2
Paralysis of the cervical sympathetic	1
Convergent strabismus (alternating concomitant)	1
Old-standing diseases (tabes, cataract, squint)	3
Normal eye	1
Doubtful cases, probably malingering, but possibly hysteroneurasthenia	6

The conclusion is drawn that ocular symptoms of shell shock are generally due to peripheral lesions rather than to commotio cerebri or psychic trauma. W. R. P.

Variations in the Clinical Course of Cases of Myasthenia.

Taylor, James (*Ophthalmoscope*, September, 1916), suggests the possibility of dividing cases of myasthenia into two distinct groups, according as the disease runs a slow and chronic course or an acute and rapidly fatal one.

Four cases are reported. The first case had double ptosis, more marked on the left than the right side, and all ocular movements impaired. This impairment varied from day to day. There was constant weakness of the arms and legs, also variable. The muscles of mastication were weak and easily exhausted, and at times there was difficulty in swallowing. There was characteristic myasthenic reaction of the arm muscles. The condition ran a very chronic course over a period of fifteen years without any permanent alteration during that time.

A second case, a woman aged twenty-four years, had an attack of weakness of the limbs so that she was confined to her bed for two weeks; she was unable to open her right eye, except for part of the time during the day. Double ptosis developed, with limitation of all ocular movements. Great weakness of masseters and temporals, and all limb movements were feeble. The myasthenic reaction was distinct in the limb muscles. Patient died three and one-half months later. A very large thymus was present.

Another case with remarkable clinical history was the following: A man, aged twenty-nine years, with a diplopia of six weeks' standing, developed double ptosis, more marked on left side, and defect in all ocular movements. There was also weakness of the limbs, which gradually increased. The muscles of mastication became so feeble that he could take only liquid food. This case made a most remarkable recovery, in spite of the fact that he was hardly expected to live more than a few days.

The fourth case was unusual in that it was complicated by a tobacco amblyopia.

These cases, varying so greatly in their clinical course, lend support to the view that the condition of myasthenia is determined by some toxic agent, and that the variations in the condition are determined by the amount of poison present in the blood at certain times. W. R. P.

A Clinical Study of Fifty-five Cases of Intraocular Retention of Foreign Bodies, With Results Two Years Afterwards.

BROWNLIE, W. BARRIE (*Ophthalmoscope*, October, 1916), concludes his treatise on intraocular bodies.

Analysis of the fifty-five cases reported brings out the following points:

1. Twenty-eight eyes were saved, twenty-seven eyes were lost—i. e., 50.91 per cent and 49.09 per cent, respectivly.
2. Visual acuity of the eyes saved: Fifteen had useful vission; in thirteen the vision ranged from 6/6 to 6/24; in three the vision ranged from 6/36 to 6/60; in three the vision ranged from 4/60 to 2/60, and in nine the vision ranged from the counting of fingers to perception of light.
3. Of the eyes lost, eight were enucleated on admission as hopelessly disorganized eyeballs, or within three days, when signs of commencing panophthalmitis presented, one went on to panophthalmitis, twelve were enucleated within three weeks

of the injury, on account of plastic iridocyclitis, six were enucleated after dismissal as atrophic, sightless eyeballs, with ciliary tenderness.

4. Two cases of sympathetic disease occurred. One was of the milder type, optic neuritic in character, and did well, with a resultant visual acuity of 6/6; the other, a severe case of the plastic iridocyclitic type, ended in almost total visual destruction of the eye, the resultant visual acuity being perception of light.

The following conclusions are drawn:

1. The urgent necessity of measures being universally adopted to prevent or at least to minimize the risk of these injuries occurring at all.

Workmen employed in an occupation where the risk of being struck with a chip of metal is possible, should wear some protection in the shape of thick plane glasses to divert the path of a flying splinter.

2. The great importance of early diagnosis of a foreign body in the eye. Early recognition of the presence of a foreign body in the eye and its immediate removal lessens somewhat the possibility of future complications.

3. The necessity of giving a guarded prognosis, especially in those cases where the metal is posterior to the lens, as regards the possibility of subsequent enucleation, serious defect of the vision of the eye, and the possibility of sympathetic ophthalmitis.

4. With regard to sympathetic ophthalmia, in addition to the usual signs mentioned in textbooks:

(a) The importance of a differential blood count being taken at periodic intervals, after the metal has been extracted, until the eye has completely recovered.

(b) The importance of having an eye from which a piece of metal has been extracted, and which subsequently has developed a plastic iridocyclitis necessitating enucleation, examined by a competent pathologist, to find out if there are any evidences of the "typical infiltration of Fuchs."

(c) When the patient at any future date makes a complaint of the uninjured eye, again the importance of a differential blood count, and of a reference being made to the pathologic condition of the injured eye, if such has been enucleated.

(d) In view of the recently published results of treatment by these drugs, the importance of salicylates and of salvarsan in the treatment of sympathetic ophthalmia, in addition to the usual local measures. W. R. P.

A Cyst of the Pigment Epithelium of the Iris, With Remarks.

STEVENSON, SYDNEY (*Ophthalmoscope*, October, 1916), reports a rare case of cyst formed by the accumulation of fluid between the double layer of pigmented cells at the back of the iris, the socalled pars retinalis iridis or pars iridica retinæ.

The patient was a woman in robust health, aged forty-three years. On examination of the right eye, tension was normal and vision with correction was 6/5. There was a group of slightly dilated vessels on the outer side of the eyeball, and a slight humping of the iris in its lower temporal quadrant. No posterior synechiæ was present, but projecting from behind the pupillary edge of the lower temporal segment of the iris was a single smooth, rounded mass of dark brown color, two by three millimeters in dimensions. It was not notched nor tremulous, and showed as a dark projection with the Leber transilluminator. The lens was slightly tilted upon its vertical axis. The fundus was normal. Left eye healthy. The diagnosis of melanosarcoma of the iris was made and the eye enucleated.

Pathologic examination showed a congery of several small cysts, formed by separation of the uveal layers of the iris, lying near the root of the latter structure in the angle of the posterior chamber. A much larger cyst, of similar structure, was situated behind the iris, centrally, as it were, to those just mentioned. It lined the inner two-thirds of the iris, and extended for some considerable distance, as a rounded projection, beyond the edge of the iris into the pupillary area.

The interior of the large cyst showed no formed elements beyond numerous tiny particles of melanin, derived presumably from its pigmented walls. An oval cyst arising from the anterior part of the ciliary body was also found.

The literature is carefully reviewed and all reported cases discussed.

The diagnosis of retroiridic cyst may be simple or exactly the reverse. Points in favor of a cyst as opposed to a solid growth would be bilaterality, multiplicity, mobility, tremulousness, noting of the visible portion of the growth, and, above all, translucency of the mass. The opaqueness of the growth in the case reported, when transilluminated, together with the history, position and color, could hardly have led to any other diagnosis than that of melanosarcoma.

With regard to the pathogeny of cysts, primary and iridopathic cysts must be distinguished from those which are secondary and symptomatic. The possibility of a congenital origin of the primary cysts is dwelt upon, particularly by W. Gilbert.

Secondary cysts of the uveal pigment have been known to follow operation on the eye and to be associated with glaucoma or with tumors of the ciliary body or iris, and it seems likely that they are commoner sequels of iridocyclitis than supposed.

The prognosis of uveal cysts, if not interfered with surgically, does not differ from that of any other intraocular growth, whether solid or fluid. They lead sooner or later to opacity of the lens (localized or generalized), secondary glaucoma, and to loss of sight, as happened in the cases reported, among others, by Collins, Eales and Sinclair, and Asayama.

As to the treatment, puncture, repeated if necessary, has been proposed, and in suitable cases might be carried out, but furnishes no guarantee against the cyst refilling.

Iridectomy, practiced in a case of Collins, may be of benefit, but cannot assure against subsequent enlargement of a second cyst. In brief, it seems tolerably safe to assume that enucleation will be the ultimate fate of many of the eyeballs affected with uveal cyst, a view that has already been voiced by Wintersteiner. W. R. P.

Iridectomy in Glaucoma.

ELLIOT, COL. R. H. (*Ophthalmoscope*, October and November, 1916), reviews history of iridectomy for the relief of glaucoma, from the time of its introduction by von Graefe. The relative value of iridectomy and sclerectomy in glaucoma is discussed, and the following conclusions given:

1. If an operation for glaucoma is to be undertaken, the earlier it is performed the better is the result likely to be; therefore, it is important to make up one's mind on the subject at the earliest possible moment.

2. Every case of glaucoma in which operation is postponed should be watched with the utmost care, and the moment that medical treatment fails to hold it in check, surgery should be resorted to without delay.

3. Special watch should be kept on (a) the condition of the visual field, (b) the tension, and (c) the visual acuity. (The order is deliberate.) A departure from the normal in all three, or in any one of them, and especially in the visual field, calls for a decompression operation.

4. Iridectomy, undertaken with the deliberate intention of freeing the natural channels of excretion, and so of restoring the status quo ante, should only be resorted to in those early cases in which there is reason to believe that such a feat is possible. Once plastic inflammation has blocked the angle of the chamber, this rôle of the procedure ceases.

5. When it is recognized that the attainment of decompression depends on the opening up of vicarious filtration channels, the obvious call is for one of the newer operations. The fact that an iridectomy or a sclerotomy may be followed by the formation of a filtration scar is beside the point. We should deliberately undertake a well-planned procedure which aims at the formation of the kind of scar we desire to produce. Any other line of action is bad surgery, since it lacks consistency and clarity of purpose.

6. Each surgeon must be guided not only by the environment of his patients, but also by his own idiosyncrasies.

7. Each case must be considered on its own merits. The relative prospects of life and of remaining months or years of sight must be carefully weighed. Against the admitted dangers of operating must be set the inexorable progress and the appalling results of the disease.

8. Statistics are wanted, both of success and failure. If they are forthcoming, as they will be, those who follow us will know what we guess, will walk where we grope, and will owe us a debt like that which we owe in our turn to von Graefe, de Wecker and the stalwarts of their time. W. R. P.

Association of Familial Disease of the Nervous System and of the Eye.

BATTEN, F. E. (*Ophthalmoscope,* November, 1916), discusses a form of cerebral degeneration associated with changes at the macula seen in several members of a childship.

The children were born healthy and developed normally to a period of life varying with the different families.

They then began to show, first, loss of intellectual faculties; secondly, loss of vision; and thirdly, loss of motor power. The disease slowly progressed, eventually rendering the child blind, demented, and spastic. The family characteristic of the disease is best shown by the pedigree trees. The disease is neither sex nor race selective.

Ophthalmic examination shows the disc a gray white color, with vessels of nearly normal size.

At the macular region there is a diffuse pigmentation. The pigmentation extends to a more or less extent into the retina around.

The pathologic appearance of the brain shows practically no macroscopic abnormality.

On microscopic examination the most marked pathologic change is a primary degeneration in the pyramidal and Betz cells of the cortex, and the Purkinje cells of the cerebellum.

The changes in the macula consist in a degeneration of the ganglion cells and a migration of the retinal pigment.

Consideration of these cases and their pathology suggests that there is a group of cases similar to the Warren Tay-Sachs family amaurotic idiocy, occurring at a later age, and not race selective. The disease is characterized by progressive blindness, progressive paralysis, and progressive dementia; but the changes at the macula are not always present, and, when present, are in some cases a late, in others an early, manifestation of the disease.

The later in life the disease appears the less acute seems to be the course, and in those cases in which the visual defect manifests itself during or after the second decade of life, there appears to be little or no liability for the central nervous system to be affected.

What the nature of the poison may be, which is so selective in its mode of action, and tends to affect several members of a childship, is a problem yet to be solved, for neither the exhaustion theory of Edinger, nor the abiotrophy theory of Gowers helps to throw light on the condition. W. R. P.

Visual Neurosis of Miners in Their Relation to Military Service.

HARFORD, CHARLES F. (*British Medical Journal*, March 4, 1916), reports a number of cases of persistence, and even aggravation, in the symptoms of the disease, which are chiefly of interest on account of their bearing on military service. The cases all give history of attacks of the socalled miner's nystagmus. The author lays stress on the view that this affection is a general nervous one, and that nystagmus is only one symptom in the case. E. S. T.

A Method of Treatment for Conjunctivitis.

JEFFERSON, FREDERICK, AND ARMSTRONG, W. E. M. (*British Medical Journal*, March 4, 1916), have treated one hundred cases, fifty of which were treated with eusol, and fifty by boric acid and zinc. The eusol was used for the following reasons: "1. It is a most powerful antiseptic. 2. It seems strangely nonirritating to the tissues, almost as though it might imitate faintly with regard to bacteria the action of salvarsan with regard to a more developed form of microbe life. 3. It has apparently already given good results in the hands of some reliable workers in the field of general surgery, though, so far as we know, it has not yet been used in infections of the eye." The solution was at first used "ten times more dilute than that used in the treatment of wounds." The strength of this was doubled and cases were irrigated three times a day. The fifty treated with eusol took an aggregate time of three hundred and three days to cure. The cases treated by boric acid and zinc took four hundred and forty-eight days. E. S. T.

The Toxic Effects of Ethylhydrocuprein on the Eye.

OLIVER, GEO. H. (*British Medical Journal*, April 22, 1916), quotes briefly from references to the use of this drug in the *British Medical Journal*, and reports a case similar in every way to a quinin blindness in a patient who had taken one hundred grains in five-grain doses every three hours. E. S. T.

Intracranial Treatment of Syphilitic and Parasyphilitic Optic Nerve Affections—Physiologic Evidences—Researches on Intravital Staining of the Optic Nerve.

SCHOENBERG, MARK J. (*Jour. Am. Med. Assoc.*, June 24, 1916). This paper is a report of experimental work pursued with the intention of finding a more efficient method of reaching the optic paths by curative agents, and ventures to suggest another way of treating optic nerve affections of syphilitic nature, which do not respond to the classical antisyphilitic treatment. "The ideas from which we have to start in handling the problem of treatment of the socalled metasyphilitic primary optic atrophies (in tabes, general paresis and some cases of cerebrospinal syphilis) would be about as follows:

"1. The condition is due to spirochetes.

"2. The syphilitic optic nerve affections are to be considered and treated in the same light and the same methods as are the syphilitic manifestations of the rest of the central nervous system.

"3. The general antisyphilitic treatment, as administered before the era of intraspinal medication, failed in a large percentage of cases, and always failed in parasyphilis of the nervous system and of the optic nerves.

"4. The intraspinal method proved the efficacy of direct local application of drugs on syphilis of the spinal cord.

"5. What could we do in order to apply the antisyphilitic medication directly on the spirochetic affections of the optic nerves?"

After some discussion of the anatomy, physiology and pathology, in connection with the problem, the author reports his experiments, which were carried out by the aid of staining agents. One cat, two rabbits and twenty-five dogs were used. Injections were made into the veins, spinal subarachnoid, cranial subdural space and lateral ventricles. In two animals, methylen blue aqueous solution were used. In the rest, one per cent trypan blue in normal salt solution or in ox serum. The microscopic findings are given. Intraspinal or intravenous injections of the stain did not reach the optic nerve. All these experiments point to one central idea, namely, that if we wish to have the medication reach the cerebral perineuronic spaces and the sheaths and septa of the optic nerves, we have to introduce it right into the cranial cavity, by way of the subarachnoid spaces or lateral ventricles. For in the end the entire scope of the treatment is frustrated if the spirocheticide is not brought in immediate contact with the spirochetes, which are

lodged in the perineuronic spaces of the brain in paretics, and most probably in the sheaths of the optic nerve and between the neurons of the retina in the socalled primary optic atrophy.
E. S. T.

A Case of Granuloma Pyogenicum Affecting the Eyelid.

Wescott, Cassius D. (*Jour. Am. Med. Assoc.*, June 24, 1916). The case was a boy of nine years, with a small tumor, "apparently a sebaceous cyst," just above the cilia of the upper left eyelid. An attempt had been made by the patient to strangulate it with a silk thread, but instead of drying and dropping off, the tumor evidently became infected, grew larger, and bled easily when it was touched. It was removed by a clean incision with curved scissors and the wound cauterized. Healing was uneventful. E. S. T.

A Study of Ophthalmoscopic Changes in Nephritis.

Slocum, George (*Jour. Am. Med. Assoc.*, July 1, 1916). This paper is written from the tabulated histories of a series of cases in the University of Michigan, and have been divided into five classes: A, chronic interstitial nephritis; B, chronic nephritis; C, acute nephritis; D, hypertension, and E, miscellaneous cases. The total number of cases was seventy-three. The cases showed the well known vascular and toxic conditions, and are analyzed in detail, and numerous interesting observations are made. E. S. T.

The Uses of the Desiccation Method in Ophthalmology, With Special Reference to Epitheliomas of Lids, Canthi and Conjunctiva—Report of Cases.

Clark, William L. (*Jour. Am. Med. Assoc.*, July 1, 1916). The details of this method have already been published in the *Journal of the American Medical Association* for September 12, 1914, page 925. The heat employed is "of just sufficient intensity to desiccate, but not to carbonize them." The heat is best generated by means of a high frequency electric current which is subject to accurate regulation. The area to be treated is anesthetized locally, either by the instillation of cocain or by infiltration of a one per cent solution of novocain and epinephrin. The needle is not thrust into the tissue but just allowed to brush it. One hundred and eighty-six lesions were treated. The author tabulates advantages over various methods of treatment, especially radium and the Roentgen rays, cautery, etc. Eighty-four epitheliomas were treated. There were six recurrences within one year, and four within two years. Of these ten cases that did recur, six patients have remained well one year or more after a second treatment. The conclusions are as follows:

"1. Desiccation is a successful treatment for localized basal cell epitheliomas of the lids and canthi, both from a curative and a cosmetic standpoint.

2. In advanced epitheliomas of these regions, when sinuses or orbit are involved, complete success is not certain because of the inaccessibility of the diseased tissue, and it is applied for palliative reasons, when operation fails or is contraindicated.

3. The results thus far in round cell and melanosarcoma of the lids and conjunctiva have been good, but a sufficient time has not elapsed in any case to determine ultimate results.

4. Success is assured in benign growths of the lids, such as angiomas, warts, moles, xanthoma and lupus erythematosus.

5. Desiccation may be used to advantage for the treatmnet of pterygium.

6. The method is valuable in the treatment of granular conjunctivitis and corneal ulcers.

7. Symblepharon usually does not follow desiccation.

8. There is no danger of applying the desiccation treatment to growths on the cornea, as it is under perfect control."

E. S. T.

Sudden Blindness Associated With Choked Disc and Nasal Sinus Disease.

BROWN, EDWARD J. (*Jour. Am. Med. Assoc.*, July 1, 1916). The case was a Russian Jewess, aged forty-nine years. Removal of the middle turbinate and the ethmoid cells was followed by an escape of pus and an immediate improvement of the vision.
E. S. T.

The Fatigue of Accommodation as Registered by the Ergograph.

HOWE, LUCIEN (*Jour. Am. Med. Assoc.*, July 8, 1916). This paper is a continuation of the previous work done by this well known author in the measurement of fatigue of accommodation by the ergograph. During the last year the mechanism of the ergograph has been so improved that it is possible to have the muscles of accommodation write their record and the muscles of convergence write theirs also on the same drum, one record above the other. In other words, we can see at a glance the relations of these two functions to each other.

E. S. T.

A Primary Intradural Tumor of the Optic Nerve—Removal With Preservation of the Ball.

Ellett, E. C. (*Jour. Am. Med. Assoc.*, July 8, 1916). This case occurred in a negro girl of fifteen years. The right eye had been blind for five years and had gradually protruded, turning inward and upward. A diagnosis of tumor of the optic nerve was made, and it was removed through a vertical incision through the conjunctiva to the outer side of the cornea, taking up the external rectus muscle. The optic nerve was divided in front of the growth and the tumor cut off as far back as possible with curved scissors. The patient made a good recovery. Histologic examination showed large numbers of glia cells, with interlacing neuroglia fibrils. A diagnosis was made of "a moderately slow growing glioma, perhaps, better, fibroglioma." E. S. T.

The Desirability of Using Miotics as Adjuvants to Mydriatics.

Gifford, Harold (*Jour. Am. Med. Assoc.*, July 8, 1916), calls attention to the fact the homatropin may "very exceptionally cause glaucoma." Eleven cases have been reported. Some years ago the author reported a case, and laid stress on three points: 1. The question as to how far away from surgical help the patient lived. 2. The question whether the retinal hemorrhages, which took place in the cited case, might have been avoided if the tension had been reduced. 3. Whether or not it was desirable to invariably use eserin, "even in comparatively young patients." Four more cases are reported, and a résumé of the literature given. The author concludes as follows: "Glaucoma from homatropin or other mydriatics, whether used for refraction or ophthalmoscopic work, is a slight but real danger. It is almost entirely preventable, and for this purpose an eserin solution not only should be instilled immediately after the examination, but also should be given to the patient to use at home until the effect of the mydriatic is gone." E. S. T.

Traumatic Pulsating Exophthalmos.

ZENTMAYER, WILLIAM (*Jour. Am. Med. Assoc.*, July 15, 1916). There can be little doubt that in the majority of cases of a traumatic origin the lesion is a rupture of the internal carotid in the cavernous sinus, and that the dilatation of the ophthalmic veins and of the nasofrontal and angular veins is the result of the venous stasis thus created. Two cases are reported. In both the common carotid was ligated. A résumé of the literature is given. The author concludes as follows:

"An analysis of the twenty-nine cases collected in this paper shows that:

"The common carotid was ligated sixteen times, resulting in a cure in seven, improvement in five, and failure in four.

"Combined ligation of the common carotid and the ophthalmic vein was done once, resulting in a cure.

"Combined ligation of the internal carotid and the facial vein was done once, resulting in a cure.

"Ligation of the orbital veins was done once, resulting in slight improvement.

"Slow ligation of the carotid was done twice, resulting in one cure and one slight improvement.

"Ligation of both carotids was done once, resulting in failure.

"Compression of the carotid and internal treatment was followed in four cases, resulting in cure in two, improvement in one, and result unknown in one.

"Gelatin injections were used in one case, resulting in a cure.

"There was no treatment in six cases." E. S. T.

Heterophoria in Children.

REBER, WENDELL (*Jour. Am. Med. Assoc.*, July 15, 1916), has searched over his private case records with the following results: In the last twenty years refraction was done in sixty-four hundred. Of this number, two thousand presented some manner of muscular anomaly. Of these two thousand, representing all ages, three hundred and forty-five occurred in children up to but not including the fifteenth year. Of this three hundred and forty-five there were thirty-five, or about ten per cent, whose muscular status demanded treatment. Strabismus is excluded from this statistics. The figures submitted would indicate that one in one hundred and eighty-three of all refractive cases will represent a child with an essential heterophoria, and that one child in ten that exhibits muscular imbalance will need some manner of treatment for its abnormal muscular status. The author's conclusions are as follows:

"1. Heterophoria in children is in a certain proportion of cases an entity which must have some kind of attention.

"2. Painstaking consideration of all the general physical factors is most imperative.

"3. Thoroughgoing correction of the refractive status is imperative, but in some cases it is merely 'first aid.'

"4. Esophoria when intrinsic will probably be best met with weak prisms (from one to two degrees), bases out, plus lateral rotation exercises.

"5. Exophoria when intrinsic will often respond to training alone, frequently will need prisms, bases in (from one to two degrees) for permanent use, and rarely comes to operation.

"6. Hyperphoria when intrinsic almost always demands vertical prisms of from one-third to one-half the total infinity deviation, and when paretic will more frequently than any other muscular anomaly justify operative interference."

E. S. T.

The Etiology of Nonparalytic Ocular Imbalance—Some Original Conceptions and Interpretations Based on the Physiology and Psychology of Ocular Movements.

WALTER, WILL (*Jour. Am. Med. Assoc.*, July 15, 1916). This paper is a detailed discussion of the physiology and psychology of ocular imbalance, and cannot be properly dealt with in the limits of an abstract. E. S. T.

Histologic Effects of Heat on the Eye.

SHAHAN, WM. E., AND LAMB, HARVEY D. (*The Amer. Jour. of Ophthalmology,* August, 1916), made observations on rabbit eyes heated by direct applications by means of a themophor. Five eyes were tested by direct application at different temperatures. These eyes were observed macroscopically and microscopically, and the findings reported in detail. The conclusions are "that the immediate effects of the heated applicator upon a rabbit's eye are, first, a swelling of the heated portion of the cornea, due to a localized edema, which with increase of heat is accompanied by destruction of the anterior epithelium; then a destruction of the posterior endothelial layer; further, by a coagulation necrosis of Bowman's membrane and anterior layers of the substantia propria of the cornea, and lastly, a swelling and coagulation necrosis of the iris. Later effects are: First, the appearance of the infiltration of the anterior layers of the cornea with polymorphonuclear leucocytes; then the formation of scar tissue and new blood vessels to replace the destroyed substantia propria of the cornea; lastly, the new connective tissue with its round pigment cells, where before was iris stroma." E. C. E.

On the Causes of Presbyopia and Cataract.

SCHANZ, F. (*The Amer. Jour. of Ophthalmology*, August, 1916), shows that lenses exposed to ultraviolet rays show chemical changes analogous to those observed in lenses opacified by age. He also shows that the crystalline lens, owing to the fact that it is filled with numerous small particles which diffract light, is especially exposed to the short rays of light. On these premises he concludes that the changes which take place in a lens with age are due to the accumulative effect of these short rays. E. C. E.

Acidosis and Edema in Its Relation to Glaucoma.

SMITH, HENRY, Amritsar, India (*Archives of Ophthal.*, January, 1916), discusses Martin Fischer's work on acidosis, and believes it to be the most rational explanation of glaucoma yet advanced. G. S. D.

Histologic Findings After Iridotasis.

VERHOEFF, F. H. (*Archives of Ophthal.*, January, 1916). Iridotasis is a modification of Holth's iridencleisis, and was first described by Borthen. It consists in withdrawing the iris through keratome incision beneath a conjunctival flap and allowing it to heal there. In chronic, noninflammatory glaucoma the operation, in the hands of Borthen, has given almost uniformly successful results. It is very simple in its performance, and the danger of late infection is certainly no greater than in the various forms of sclerostomy.

Verhoeff now reports microscopic examination of an eye in which the operation had been performed one month previous to enucleation. Enucleation was performed on account of recurring tension. The case was one of advanced chronic congestive glaucoma, just the kind which Borthen states is not favorable. Verhoeff believes that failure in this case was due to traction of the sphincter, which subsequently pulled the pupillary margin downward until it came into contact with the anterior lip of the wound. Healing then took place and drainage was cut off, the prolapsed iris forming simply a distended cyst. The amount of inflammatory reaction was notably slight. G. S. D.

Lumbar Puncture and Examination of the Spinal Fluid in Affections of the Eye.

Ayer, James B. (*Archives of Ophthal.*, January, 1916). The paper is based on the examination of one hundred and sixty cases, and as a prelude the writer states that the greatest value of lumbar puncture is in the cases showing early symptoms referable to the central nervous system. There were forty cases of external ocular palsies. All but five showed evidence of meningeal irritation. In five cases the fluid was normal. In cases not congenital or with other obvious ocular motor palsy, syphilis of the nervous system is manifested.

Primary optic atrophy, forty-four cases. Of these, twelve spinal fluids were normal, but in four of these the blood had shown previously a positive Wassermann. This group of diseases is then to be mostly associated with the true nerve syphilis. Treatment of the oculomotor palsies should be begun within six months. Ayer is not encouraged by his results of the treatment of optic atrophies of specific origin.

Optic neuritis and choked disc. Out of ten cases on whom lumbar puncture was performed at the time of the acute process, five were shown to be syphilitic and in three additional ones the blood showed syphilis. It is gratifying to see the rapidity with which these cases of syphilitic origin clear with salvarsan.

Abnormal pupils. Of all manifestations of central nervous syphilis, the abnormal pupil is apt to be one of the earliest. It is exceptional to find a well marked case of advanced syphilis of the nervous system with normal pupils. Ayer has examined thirteen cases where this was the sole sign. Of these, nine gave positive tests for syphilis. Four cases were negative. The writer believes that they represented cases of arrested nerve syphilis. The spinal test is of great value in determining whether the disease be active or stationary. Irregular pupils are also often the result of syphilitic infection.

Twelve cases showed absolutely normal pupils, and yet were the subjects of active syphilis, seven of them with involvement of the cerebrospinal system. Thus, it shows that a normal pupil does not preclude the existence of severe cerebrospinal syphilis. G. S. D.

Massive Granuloma of the Sclera (Brawny Scleritis), With the Report of an Unusual Case.

Derby, George S. (*Archives of Ophthal.*, January, 1916). Brawny scleritis usually appears typically as a gelatinous, brownish red infiltration of the conjunctival, episcleral and scleral tissues, most marked close to the limbus. The swelling may overhang the cornea and extends back a variable distance from the limbus. There is enormous dilatation of the blood vessels and lymphatics. Pain and tenderness are acute. The cornea is later involved, and the uvea takes a greater or less part. The sight fails, pain becomes acute, and finally enucleation must be performed. The condition is characterized by extreme chronicity and acute exacerbations. Atypical cases may vary more or less from the classical type. Usually but one eye is affected. In three cases, however, both eyes were lost.

The etiology is uncertain. The average age of sixteen cases was sixty-one and a half years.

A somewhat atypical case is here reported. Inflammatory changes involving principally the posterior half of the eyeball. There was an enormous thickening of the posterior half of the sclera. Microscopically, the process was characterized by a slow invasion of the sclera by granulation tissue.

The pathologic examination was made by Dr. F. H. Verhoeff of Boston. G. S. D.

Torticollis Relieved by Tenotomy of the Inferior Oblique.

DUANE, ALEXANDER (*Archives of Ophthal.*, January, 1916), reports the case of a child with head tilting to the right. The left eye deviated upward. If the left eye were bandaged, the child immediately held its head straight. Examination showed a congenital insufficiency of the right superior rectus, fixation with the paretic eye and sharp secondary deviation of the sound eye. The condition was very much improved by complete tenotomy of the left inferior oblique.

Duane gives the chief indications for tenotomy of this muscle as paralysis of the superior rectus with fixation of the paretic eye, and consequent secondary deviation of the inferior oblique in the other eye; also, in paralysis of the superior oblique with secondary deviation of the inferior oblique in the same eye. The first condition is rather frequent.

The writer describes and illustrates the technic of the operation, which is not difficult, and further discusses head tilting due to muscular deviations of the eyes. The article should be read in the original. G. S. D.

Concerning Focal Infections in Their Relation to Certain Disorders of the Uveal Tract.

DE SCHWEINITZ, G. E. (*Ophthalmic Record,* December, 1915). In all probability, uveitis or iridocyclitis is due to a septic or toxic source, and it is of importance to ascertain the position of focal infection which gives rise to it.

Syphilis may be regarded as the chief instigator of this disease, and tuberculosis plays an important part, while rheumatism—that is, acute arthritis or rheumatic fever—has been placed in the background.

Septic oral conditions play an important part in a number of diseases and organic lesions. H. L. Ulrich, in a little over sixty-eight per cent of all artificially devitalized teeth, found apical abscesses. The relation of the parasitic amebas to pyorrhea is becoming well known.

It may be said that the organisms in a septic mouth are perfectly capable of producing a nonseptic uveitis, although the primary lesion is suppurative, because they decrease in virulence in their contact with blood serum.

Infection may come from small tooth root abscesses or from a blind abscess. Various cases of this sort are on record.

Focal infections in other parts of the body, nose, nasal accessory sinuses, the tonsils, skin, uterine cavity, prostate, and probably the seminal vesicles, are equally important. Ulrich says that we must be very cautious concerning the innocent looking tonsil, as it not infrequently forms a source of infection.

Much laboratory investigation may be adduced in support of the relationship of the socalled gastrointestinal autointoxication with uveitis and iridocyclitis.

Just because a disease such as syphilis is present in a case is no reason why we should not also try to eliminate focal infections.

The importance of a gonococcus infection is emphasized. De Schweinitz has been impressed with the value of bacterins in gonorrheal iritis or iridocyclitis. He, however, warns against imprudent use of bacterial vaccins. G. S. D.

Ocular Diseases Resulting From Dental Lesions.

BLACK, ARTHUR D. (*Ophthalmic Record,* December, 1915), impresses us with the fact that the day seems to be dawning when the dentist will come to appreciate the fact that "one of his most important duties is to keep the mouths of his patients free from infection, rather than to find such foci after their presence has been heralded by a secondary manifestation."

Inflammations of the pulp may cause severe reflex pain in the eye.

The writer then goes on to consider the pathology of the peridental membrane, and gives numerous plates and X-rays to illustrate the special features of different cases. For one who is interested in this branch of the subject, the article should be read in the original. G. S. D.

A Method of Study of General Diseases in Their Relation to the Ocular Structures.

PORTIS, M. MILTON (*Ophthalmic Record,* December, 1915), makes a plea for the most thorough examination of the patient in diseases of the eye where the cause is obscure. He regards the absorption of products of impaired motility of the bowel as an important source of trouble. G. S. D.

The Fundus Lesions in the Various Forms of Nephritis.

BULSON, ALBERT E., JR. (*Ophthalmic Record,* December, 1915), confines himself to a consideration of the fundus lesions in acute and chronic nephritis. Neither parenchymatous nor interstitial nephritis ever exists alone, and there is no occasion to separate the lesions of chronic Bright's disease from those of arteriosclerosis, since chronic Bright's disease should be considered as a disease of the cardiovascular system. The fundus alterations are evidence of a toxin in the blood stream acting on the retinal blood vessels and on the inner layers of the retina.

The writer goes on to discuss the general features of renal retinitis with especial reference to the early ophthalmoscopic appearances. G. S. D.

A New Nasal Punch.

PRINCE, A. E. (*Ophthalmic Record,* December, 1915). Illustration of a new punch for cutting away a portion of the nasal wall of the lacrimal sac. G. S. D.

A Trial Case Accessory.

DOWNEY, J. W., JR. (*Ophthalmic Record,* December, 1915), describes a lens carrier which will hold crossed cylinders, allowing two sets of lenses to be shifted quickly. G. S. D.

Dionin in the Treatment of Vernal Catarrh.

SWIFT, GEORGE (*Ophthalmic Record,* December, 1915), finds that dionin in a five per cent solution readily alleviates the symptoms of vernal conjunctivitis. G. S. D.

Intraocular Tuberculosis.

JACKSON, EDWARD (*Ophthalmic Record,* January, 1916), points out the fact that the classic choroidal tubercle and the granuloma are seldom seen. Miliary tubercles of the choroid are also usually not present in evident tuberculosis, but are seen only in tuberculous meningitis and generalized miliary tuberculosis. They probably appear only in the terminal stage.

There is every reason to accept the views of Stock and Axenfeld that tuberculosis is a common cause of chronic choroiditis and choroidal atrophy. Recurring hemorrhage in the vitreous and retinitis proliferans have been shown often to be due to this disease, also the recurring hemorrhage of the retina and retinal phlebitis. Some of the best studied cases of massive exudation into the retina have given evidence of a tuberculous origin.

It is just as important to insist on outdoor living under favorable surroundings and conditions in these cases of ocular tuberculosis as in the pulmonary type.

Jackson believes that the use of tuberculin has quite changed the prognosis of tuberculous keratitis and iritis, but there is a tendency to give too large doses and to repeat them too frequently. Once a week is often enough, and sometimes too often. It is wiser to begin with an interval of two weeks. The slightest rise of temperature should be avoided. In fundus cases an ophthalmoscopic examination may be made the day after each tuberculin injection, and when a reaction is seen the dose should be increased but little and at long intervals.

G. S. D.

Some Observations on Ocular Tuberculosis and Its Treatment.

McCool, Joseph L. (*Ophthalmic Record*, January, 1916), says: "I am inclined to believe that where you have an inflammation of an eye of obscure origin in which the patient responds positively to the subcutaneous injection, both locally and generally, but not focally, and in whom, after a careful examination, it is impossible to determine the presence of inflammation in any other part of the body but the eye, and in whom syphilis, gonorrhea, accessory sinus disease, carious teeth and infected tonsils, have been eliminated, it is certainly fair to assume that the infection in the eye is tuberculosis." (In view of the fact that a very large percentage of the human race will react to the tuberculin test, this statement seems to go a little beyond the facts.)

McCool uses bacillen emulsion, starting with a small dose and trying to avoid a reaction. The intervals are from two days to a week.

Cases of various forms of tuberculosis of the eye are then reported. G. S. D.

A Consideration of Some of the Ocular Conditions Dependent Upon Tuberculosis and Systemic Gonorrhea.

POSEY, WM. CAMPBELL (*Ophthalmic Record*, January, 1916), believes in using subcutaneous test for diagnosis in doubtful cases. He uses three doses of one, two and three milligrams of old tuberculin.

Posey cites evidence to show that a certain percentage of cases of interstitial keratitis are of tuberculous origin. He emphasizes the relationship of tuberculosis to phlyctenular disease.

In treatment, Posey uses tuberculin, beginning with a dose of 1/500 milligram and doubling the dose every forty-eight hours until a general or local reaction is obtained. After an interval of some days, when the reaction has subsided, the dose, the weakest to that which produced the reaction, is injected twice a week until the condition improves. The maximum dose should not exceed one milligram.

The formation of tuberculosis classes is to be recommended, and a description of a tuberculosis class at the Massachusetts Charitable Eye and Ear Infirmary is given.

Posey is enthusiastic over the use of tuberculin for treatment.

He then considers the question of metastatic infection of the eye with gonorrhea. In metastatic conjunctivitis, although the gonococci are found in the secretion in some cases, they are absent in most. This fact may be explained by Axenfeld's suggestion that they lie imbedded in the conjunctival tissue. When they are actually present in the secretion, it means an exceptional intensity of the inflammation.

He cites Byers' monograph upon the ocular manifestations of systemic gonorrhea, in which forty cases of affections of the cornea were reported, nine of which were probably metastatic in origin.

Griffith attached great importanec to gonorrhea as a causative factor in iritis, and thought that the ocular inflammation was not only likely to occur as a complication but also as a sequel of gonorrhea.

In a series of cases reported from St. Bartholomew's Hospital of one hundred and fifty-nine cases, eight per cent were in all probability due to gonorrheal infection.

Other statistics are given.

The employment of gonococcic vaccins in the treatment has not been attended with flattering success. Posey has used it in quite a number of cases, in most without benefit, and in some others it seemed to be productive of harm. G. S. D.

Tuberculosis of the Eye, With Special Reference to Treatment.

GAMBLE, W. E. (*Ophthalmic Record,* February, 1916), cites evidence to show that cases of tuberculosis of the eye that respond to small diagnostic doses are the ones that respond most favorably to tuberculin treatment; therefore, the smaller diagnostic doses are coming into favor.

He emphasizes the fact that tuberculosis of the eye may exist without focal reaction, being produced by tuberculin.

The most potent weapon in the fight against tuberculosis lies in building up the general resistance of the patient. However, general resistance comes slowly, and much harm to the organ may result before this is acquired. In tuberculin we have a means of inhibiting the progress of the disease and curing it in many cases.

He believes that the important curative effect of tuberculin lies in establishing an active immunity against the disease. Safety in the use of tuberculin lies in a dose far below that which will produce any untoward symptoms. A feeling of well-being, good appetite and increasing weight are good evidences that the patient is getting the proper amount of tuberculin. Gamble apparently believes in small doses continued over a long period of time.

He cites a number of types of ocular tuberculosis.

G. S. D.

A Case of Unilateral Optic Atrophy, the Sole Symptom of a Pituitary Growth.

KRAUSS, FREDERICK (*Ophthalmic Record,* February, 1916). The patient, twenty-four years of age, complained of loss of vision in the left eye for three weeks. The optic nerve was grayish. There was a temporal hemianopsia of the left eye and an absolute central scotoma. X-ray showed a considerable enlargement of the sella turcica. Under electrical treatment, vision improved from excentric vision only to 5/12. The peripheral field became nearly normal, and the large scotoma remained on the temporal side of the fixation point. Further improvement took place to 5/9.

Further loss of vision then took place, and loss of hearing in the left ear was noted. Involvement of the right eye then occurred. Patient was operated on, and improvement of the vision took place. Unfortunately, meningitis occurred and the patient died.

Diagnosis was struma of the pituitary. G. S. D.

Detachment of the Retina Improved if Not Cured.

LOEB, CLARENCE (*Ophthalmic Record,* February, 1916). Patient had a spontaneous detachment about four disc diameters temporal to the disc, extending irregularly upwards, downwards and peripherally. Treatment consisted of hot applications, sweats every second night, salt injections, dionin and internal treatment. Unnecessary use of the eyes was forbidden.

The amount of visible detachment became less. The field increased by half. At the present time the scotoma is so small as to be negligible, and the vision is 6/6. There was slight recurrence. Patient was not confined to his bed. G. S. D.

A Simple Tonometer for Clinical Use.

SOUTER, WM. NORWOOD (*Ophthalmic Record,* February, 1916), describes a very cleverly designed spring tonometer, which is used with the patient sitting upright, and requires only a moderate amount of dexterity. In its readings it agrees well with the Schiötz instrument. It is manufactured by De Zeng. G. S. D.

Corneoscleral Subconjunctival Seton in Glaucoma Simplex.

WHEELOCK, K. K. (*Ophthalmic Record*, February, 1916), says that his operation is a simplifying of the Zorab and Casey Wood procedures.

The conjunctiva is dissected from the sclera down to the sclerocorneal margin. A Graefe cataract knife is passed through the subconjunctival pocket into the sclera one millimeter behind the limbus into the anterior chamber. A Riverdin needle is next passed through the subconjunctival pocket into the anterior chamber and then punctures the cornea. The eye is opened, and a loop of zeros braided white silk is grasped. The needle is then withdrawn, pulling the suture into the anterior chamber and then out through the scleral wound. The loose ends upon the cornea are cut off flush, and the double thread is drawn into the anterior chamber. The conjunctival wound may now be closed. G. S. D.

Cilia in the Anterior Chamber.

SMALL, CHARLES P. (*Ophthalmic Record*, February, 1916). The cornea of the right eye was lacerated by a piece of spike which flew up. Iris was slightly torn, and there was a slight prolapse. Traumatic cataract formed.

Several days later a cilium was seen in the anterior chamber and was withdrawn at operation.

A cilium twelve years in the anterior chamber was reported by Barr. G. S. D.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

FRANK C. TODD, M. D.,

MINNEAPOLIS.

J. W. CHARLES, M. D.,

ST. LOUIS.

MAX W. JACOBS, M. D.,

ST. LOUIS.

HARRY S. GRADLE, M. D.,

CHICAGO.

HANS BARKAN, M. D.,

SAN FRANCISCO.

Blood and Ocular Changes in Experimental Cholesterinemia.

VUSÉ (*Deutsche med. Wochenschrift,* 1916, No. 30). Feeding rabbits with cholesterin and oil resulted in a high-grade permanent lipemia. Very early (before any opalescence of serum takes place) an opaque ring about the corneal margin is formed, resembling in every particular the arcus senilis of the human. The ring is independent of any vascular changes, and is solely an infiltration of cornea with cholesterin fat mixtures. H. B.

Optochin Amaurosis.

LORANT, L. (*Deutsche med. Wochenschrift,* 1916, No. 30), warns against the use of optochin hydrochlorid in pneumonia, mentioning the fact that two dozen cases of partial blindness and eight of total and permanent blindness have been recorded in recent literature. In the case which he observed, the physician had ordered optochin hydrochlorid 0.2 grain every two hours for twenty doses. After taking the nineteenth powder (from the fourth one on there was severe tinnitus), sudden blindness ensued. Examination showed wide nonreacting pupils, discs pale, sharp borders, arteries small, left fundus showed few fine hemorrhages. Six and a half months afterwards, status idem. H. B.

Hemeralopia in Soldiers.

Birch-Hirschfeld (*Deutsche med. Wochenschrift*, No. 42, October, 1916) examined one hundred and forty cases: Of these, one hundred and eight had suffered from hemeralopia before the war, but the condition had been aggravated during service. In thirty-two of the cases the condition had become noticeable during service; in nine cases there was loss of blood; in five gastrointestinal disturbance had formed a certain causal factor. These cases offer a good prognosis. Those complicated with myopia (sixty cases were myopia, of which twenty-six were of more than six diopters), those with fine pigment accumulation (thirty-eight cases), poor in pigment (twenty-seven cases), are chronic forms of poor prognosis as regards their ability to perform all of a soldier's duties. The field for blue was especially restricted in these cases, and blue dots upon a gray card, even after one-half hour's dark adaptation, were much harder for the patient to distinguish than for the examiner. H. B.

Tabetic Optic Atrophy.

Gennerich, W. (*Klin. Monatsblätter f. Augenheilk.*, April-June. Abstracted in *Deutsche med. Wochenschrift*, No. 39, September, 1916), praises the action of endolumbal treatment of tabes, especially in its rapid action on cases of tabetic ocular paralysis, but expresses doubt as to whether optic atrophy is influenced. H. B.

Central Recurring Syphilitic Retinitis.

Fuchs, E. (*Zentralblatt. f. Augenheilk.*, July-August, 1916). Seventeen years after luetic infection the patient developed central scotoma, bilateral two to three times a year, disappearing after six to eight weeks; during the first few attacks no visible retinal changes. Later a very fine edema of the retinæ, with fine yellow dots in the macular region, developed. Fuchs explains the condition by assuming a syphilitic change of the retinal arteries, leading to circulatory disturbances and transudations. H. B.

Clinical Findings With Focal Illumination by Means of the Gullstrand-Nernst Slit Lamp.

ERGGELET (*Klin. Monatsbl. f. Augenheilk.*, October-December, 1914) recommends this means of illumination very highly. Pathologic changes can be noted much earlier than by other means, and diagnoses often made so that valuable time can be gained in the treatment. M. W. J.

Nerve Fiber Defect in Retinochoroiditis Juxtapapillaris (Edmund Jensen).

VAN DER HOEVE (*Klin. Monatsbl. f. Augenheilk.*, October-December, 1914). Observation of a case having the typical features of this condition with the characteristic nerve fiber defect and infiltration, but with central involvement, led van der Hoeve to suggest a guarded prognosis as regards eventual function. Six of twenty-five cases were left with marked visual defects.

The disease differs from other inflammations of the retina in the participation of the nerve fiber layer. It is therefore better, as long as the choroidal involvement is not typical, to omit this term and to call the condition neurofibrillitis retinæ. (Edmund Jensen.) M. W. J.

The Myotonic Convergence Reaction of the Pupil.

OLOFF (*Klin. Monatsbl. f. Augenheilk.*, October-December, 1914). This phenomenon consists in the fact that on looking into the distance after convergence, the contracted pupil does not dilate as rapidly as normally. It must not be confused with the Argyll-Robertson pupil. It exists clinically in two forms. In the majority the picture is one of delayed course of the convergence reaction—i. e., a pure pupillary reaction. The slowness of the convergence reaction can manifest itself in that both phases of the reaction—contraction or dilatation—last abnormally long, or that one phase occurs in the normal way. The former has been most often observed. In all cases the reaction to light is found to be sluggish or absent. In the majority of cases a central origin must be assumed. It is to

be considered a pathologic reaction, but its origin or clinical significance or importance are at the present time unknown.
M. W. J.

Latent Nystagmus.

Dorff (*Klin. Monatsbl. f. Augenheilk.*, October-December, 1914) reports two cases in which, when one eye was covered or the patients prevented from using both eyes, nystagmus was elicited. Fromaget named this phenomenon latent nystagmus. Errors of refraction and disturbances in muscle equilibrium are common in these cases. This is principally manifested as convergent strabismus and often complicated by hypertropia. In some cases the tendency toward inheriting these muscle troubles is striking. Dorff suggests the possibility of a disturbance in the relationship of a supranuclear tonic association and a rhythmic or clonic center. What form of stimulus disturbs the normal balance is not yet clear.

Therapeutically we must correct errors of refraction and cause the patient to give up any employment which may require monocular vision. If fusion is lacking, one observer suggests putting darker and darker glasses before the poorer eye. in order to gradually exclude one and improve the fixation power of the other. Operation for the squint seems to be of cosmetic value only. M. W. J.

Changes in the Optic Nerve Induced by Arteriosclerosis at the Base of the Skull.

Heinrichsdorff (*Klin. Monatsbl. f. Augenheilk.*, October-December, 1914) describes the brain of an old woman who showed during life a left-sided homonymous hemianopsia. Marked arteriosclerotic changes were found in the vessels at the base of the brain. The defect in the visual field was due to central changes and not to pressure on the optic nerve chiasma or tract, as might at first be assumed from the appearance of the pathologic material. M. W. J.

The Development of an Intraocular Sarcoma on the External Surface of the Eyeball, Together With a Consideration of Ring Sarcoma.

Pindikowski (*Klin. Monatsbl. f. Augenheilk.*, October-December, 1914). In an elderly female the vision of whose one eye had sunk to a mere trace, a melanotic tumor developed in the iris of the other eye. Nine years previous numerous pigmented spots had been observed in this iris. The tumor developed, as in the majority of such cases, in the lower half of the iris. An iridectomy was only partially successful, part of the tumor mass being left behind. After six months a recurrence of the tumor in the scar. Enucleation was done after another six months, and fourteen months after this operation no recurrence or metastasis had appeared.

Anatomically an intraocular melanotic spindle cell sarcoma was found which filled out the lower cameral angle and which was continuous, by way of the first operative wound, with a similar growth on the superficial surface of the bulbus at the lower corneoscleral border. Examination of serial sections demonstrated ring form sarcomatous tissue in the vicinity of the circul. arter. major, and which everywhere encroached on the corpus ciliare. The superficial growth nowhere produced a change in the histologic structure of the cornea. Active cell migration is the explanation offered for the appearance of this growth.

M. W. J.

Choked Disc in Sclerosis Disseminata.

TSCHIRKOWSKY (*Klin. Monatsbl. f. Augenheilk.*, October-December, 1914) calls attention to the rapid course of the process wherever reported. In practically all cases, as in his own, tumor cerebri was the diagnosis, made in vivo. Tschirkowsky made a histologic examination, which he reports in detail. The patient was a twenty-five-year-old peasant. Microscopic examination showed sclerosis disseminata atypica acuta. The lesions compared to those previously reported were exceptionally fresh. There was evidence of stasis throughout the course of the optic nerve. This, together with the interference in lymph circulation in the optic nerve at a certain stage of the process, serves, perhaps, to explain the edema of the papilla.

M. W. J.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

M. W. FREDERICK, M. D.,

SAN FRANCISCO.

JESSE S. WYLER, M. D.,

CINCINNATI.

The X-Ray Treatment of Visual Troubles of Hypophyseal Origin.

TERRIEN, F., Paris (Le traitement par les rayons X des troubles visuels d'origine hypophysaire, *Arch. d'Ophtalmologie*, Vol. 25, No. 5, p. 257, September-October, 1916). Unless a brain tumor contain a substance of greater density than the brain tissue, the diagnosis with radiography is oftener a miss than a hit. Not so with tumors of the hypophysis, which give rise to alterations in the outlines of the sella turcica which are easily recognized by means of radiography. As to the therapy of these tumors, although the results of hypophysectomy in animals has given brilliant results, the successful outcome of the operation in humans has been so infrequent that our hope as yet is in radiotherapy and organotherapy, generally in the combination of the two.

To the cases already reported by Gramnega, Béclère and Jaugeas, the author adds one case of his own, in which the good results have lasted four years, and one by Lapersonne.

In order to obtain the greatest penetration of the rays a very hard tube is used with an aluminum filter of varying thickness. Two paths present themselves: through the skin, and through the mouth. The buccal path, which is the one generally adopted, offers these two advantages: In the first place it is more direct, the tumor being closer to the palatine mucosa than to the skin; in the second place, the only obstacles opposing the passage of the rays are the palatine vault, the mucosa of the rhinopharynx, and the body of the sphenoid, or, rather, the two thin walls of bone forming the floor and the roof of the sphenoidal sinus. The disadvantage lies in the small size of the tube which can be introduced into the mouth, on account of the limit to the separation of the jaws, and the necessity of directing the tube obliquely so that its axis will pass through the junction of the palatal vault and the soft palate. This precludes the ues of a bulb having more than three centimeters internal diameter, and makes the application of the rays a rather difficult matter. It will be of greatest use when the tumor lies toward the sphenoidal sinus.

Béclère advises adding the use of radiation through the frontotemporal region, which allows one, without exceeding the limit of tolerance of the skin, to double, quadruple, and even to intensify tenfold the dose received by the hypophysis. This latter method of application was the only one used by the author. The region is laid off in sections, each of which is used in turn. The hypophysis is about seven centimeters distant from the cranial surface in this region.

Jaugeas, experimenting on a dry skull half filled with brain tissue, found that with an unfiltered ray No. 8 the amount of ray absorbed was ninety-six per cent of the amount applied to the surface. The amount received by the hypophysis is increased to five per cent by using an aluminum filter one millimeter thick, and to six per cent by the use of a filter of two millimeters thickness. Thicker filters would increase the amount of ray received, but the greatly prolonged time of exposure renders the use of very thick filters impracticable. It is, therefore, better to use the thinner filters and increase the number of points of application.

The thinner the cranial bone the more ray will pass; therefore, the most favorable points are the temporal fossæ and the frontal regions near the root of the nose. A special apparatus makes the application of the rays an easy matter: a series of localizing cylinders of lead glass are adapted to the protecting cupola which encloses the tube in such a manner that the axis of each cylinder passes through the emissary focus of the rays. In this way the rays pass without fail through the hypophysis. There is no reason to fear that the normal brain tissue may be injured or its functions interfered with. The applications were given at first every week, and later on at longer intervals.

As to the early diagnosis of tumors of the hypophysis, the diminution of the fields for form and color, the presence often of a bilateral hemianopsia, and of insular scotomata, is the most important. Contrary to the frequent presence of papillitis in other tumors of the brain, it is extremely rare with hypophysis tumors, the explanation being that the compression of the optic nerve takes place so slowly that edema does not occur. In one hundred and forty-eight tumors of the hypophysis there were thirty-four cases of blindness without other symptoms; in thirty-seven, bilateral hemianopsia was found; in two cases, homonymous hemianopsia; in fifteen, neuritis optica; in twenty-seven, optic atrophy; and in fifteen, papillary stasis. The bilateral hemianopsia is seldom, except for brief periods in some cases, of a regular form. Another feature is the frequent occurrence of relative or absolute scotomata in the nasal part of the field which had retained its function. The scotomata for colors are greater in extent and precede the scotomata for colors, and this rule is also true for the other parts of the visual field.

The author then adds two cases to eight already excerpted. The first, that of Lapersonne, concerned a young teacher, aged twenty-four years, who complained of a blurring in the right side of the field, recurring headaches, and who presented symptoms of acromegaly, such as an exaggeration of the orbital margins, an increase in height, growth of hands and feet. The radiogram showed a marked enlargement of the sella turcica. Examination of the field of vision showed a mild diminution of the field in the right eye, and a total loss of temporal half in the left eye. Later she developed a paracentral scotoma in the right eye. Under radiotherapy the paracentral scotoma disappeared and the fields regained some of their loss, the visual acuity improved, and the headaches disappeared. In some of the eight cases cited, vision returned in part in eyes that had been blind for several months. The presence of a paracentral scotoma should always direct attention to the hypophysis, as it is often the beginning of a hemianopsia. The early participation of the papillomacular bundle in this process might be explained were it possible to obtain more material for microscopic investigation as to the exact position of this bundle in the chiasma; unfortunately, in those cases where material was obtainable the chiasma was destroyed to such an extent that it has not been possible to trace the points upon which pressure was exerted. In only one case of the seven examined by Nettleship could the anatomic examination be carried out, and in this case there was a cystic tumor of the sella turcica. In other cases all that could be discovered was a basal meningitis. No doubt there is compression at the posterior part of the chiasma, where the decussation of the papillomacular bundle is assumed to take place. All tumors arising in the infundibulum and around the hypophysis give rise to the same symptoms as true tumors of the hypophysis; and, as they all develop on the level of the posterior part of the chiasma, one can readily understand the pushing forward of the chiasma, and the pressure on the posterior part of the chiasma—i. e., on the papillomacular bundle. Should the exact place of decussation of this papillomacular bundle be confirmed by further findings, the paracentral scotoma would have a great diagnostic value, and be a valuable indication in case of surgical interference. One must not forget that other inflammatory foci can also cause a paracentral scotoma if they develop in the neighborhood of the chiasma, namely, meningeal foci, sclerogummatous foci, and lesions of the cavernous sinus.

Once the presence of a tumor has been determined, one should immediately have recourse to radiotherapy; the sooner it is begun the more hope of a good result. Nevertheless, however far advanced the changes, one should not hesitate to employ radiotherapy, as not alone can this therapy arrest the further progress of the disease, but will often cause a retrogression in the changes already present.

Given a tumor of the hypophysis and an unsuccessful course of antiluetic treatment, one should at once have recourse to radiotherapy in the purely ophthalmic cases. Where signs of acromegaly are present, one should employ the treatment only in the first stages, where there is hyperfunction of the gland.

In the period of hypofunction, when retrogressive and destructive lesions present themselves, which lead to death, one should abstain from radiotherapy.

In some cases, notably those of insufficiency of the hypophyseal gland, one can add organotherapy, consisting in taking by way of mouth tablets of hypophysis substance, or injecting hypodermatically hypophysin, together with ovarian substance or iodids. The latter applies only to those cases showing glandular insufficiency.

Should radiotherapy and organotherapy fail, recourse might be had to surgical intervention. The nasal route is now the method of choice. The operation acts like other decompression operations, relieving especially the symptoms of intracranial hypertension. The external nasal route affords an easy access to the tumor, even when it is deeply situated, but the mortality in this method is much greater, owing to the frequent infection of the meninges, being thirty-eight per cent, as against ten per cent by the endonasal route. The latter, however, is adapted to small tumors only, those that have not passed beyond the limits of the sella turcica; but even in those which have passed those limits the puncture and curettage of the cystic parts, which are almost invariably present, produces a decompression sufficient to abate the major part of the symptoms. The appearance of optic symptoms shows that the tumor has passed beyond the limits of the sella turcica, as it proves that it has already reached the optic chiasma.

The author believes that with the improvement in technic the operative procedure will be the one of choice; until then the inoffensive character of the radiotherapy and the possibility of applying it early deserve to make it popular.

M. W. F.

Macular Vision in Hemianopes With Intact Macular Vision.

VINSONNEAU (La vision maculaire chez les hémianopsiques à zone maculaire intacte, *Arch. d'Ophtal.*, September-October, 1916, Vol. 35, p. 287) found in three cases of hemianopsia due to injuries to the skull from firearms, in which the macular region was still included in the field of vision, and which presented emmetropia and a normal fundus, that the better vision was found on the same side as the head injury. Of the pertinent cases collected by various authors, eleven showed the same phenomenon, twenty-one had equal vision in both eyes, and in thirty-three no mention of the visual acuity is made. What this has to do with the relative importance of the straight and crossed macular bundles remains to be seen. M. W. F.

Elliot's Method.

Bistis, J. (Sur le procédé d'Elliot, *Arch. d'Ophtal.*, Vol. 35, September-October, 1916, p. 291) is a warm advocate of Elliot's trephine method, and cites some of his own cases in which the results have been highly satisfactory. He does not turn down a conjunctival flap, but proceeds as follows: With scissors or a thin knife the conjunctiva is incised close to the corneal margin over the superior third of the latter's circumference, and a large flap is undermined, exposing the sclera freely. A silk thread is placed on either side of the incision, and these are tied after the trephining has been done, and thus the corneoscleral canal is easily covered. The advantage of this is that the trephining can be done with greater safety, as one has a clear view of the limbus. The flap of Elliot becomes very thin towards the corneal margin, and tears easily, thus exposing the eye to the late infection mentioned by several authors.

Bistis uses a trephine of one and one-half millimeters with a stop device; to avoid a sudden opening into the anterior chamber, he stops once or twice and removes the trephine. When the trephine button seems prominent above the surrounding tissue, he goes ahead very gently. Bistis considers the trephine operation much easier and less dangerous than iridectomy, sclerotomy, and sclerectomy, and that it serves in cases in which a typical iridectomy cannot be done, such as chronic inflammatory glaucoma with very shallow or absent anterior chamber, secondary glaucoma, very painful inflammatory glaucoma when it is impossible to administer a general anesthetic or where a free scleral incision would be dangerous; and in cases of hydrophthalmia and glaucoma after luxation of the lens, in which classic iridectomy would subject the patient to serious complications. M. W. F.

Working of a Private Ophthalmologic Hospital of Twenty Beds During Seventeen Months of War.

Dor (Fonctionnement d'une clinique privée d'ophtalmologie de 20 lits pendant 17 mois de guerre, *La Clinique d'Ophtal.*, May, 1916) took care of fifty wounded during the first month, but after reorganization of the medical work, had only one hundred and fifty in the next sixteen months. The hospital was then closed pending Dor's departure to the front. The character of wounds varied greatly in the two periods, due to the different types of warfare. A tabulation of one hundred and seventy cases is given. Foreign bodies were found in the majority of the enucleated eyes, about forty per cent of which were nonmagnetic. J. S. W.

Sulphur Revived in Syphilis as a Valuable Aid to Arsenic, Mercury, and Iodids—Method of Use.

Darier (Le soufre réhabilité dans la syphilis, adjuvant précieux des arsenicaux, du mercure, et des iodures. Mode d'emploi. *La Clinique d'Ophtal.*, May, 1916) says that metals which increase the oxygen in the blood serum of the patient are the ones which cure syphilis, there being no direct action upon the spirochetes. Today sulphur in the form of diorthoaminothiobenzen or intramin is the best preparation. It is a yellow amorphous powder, nontoxic, with a dosage of 1.0 of the powder suspended in 9.0 of olive oil or paraffin, injected intramuscularly. It is not changed by air and keeps as well as the oils of mercury. McDonagh, who investigated and described the preparation, notes that in the first stage salvarsan is more effective, but intramin is better for the second and third periods. If early in the disease intramin is administered first, followed by salvarsan, there is little result, but if the arsenic is given precedence, then the results are marvelous. In late syphilis intramin administered alone acts most favorably. In primary syphilis two to three grams of potassium iodid are prescribed daily and an intravenous injection of salvarsan. Three days later an intravenous injection of salvarsan. Three days later an intramuscular dose of 1.0 to 2.0 intramin. A week later another strong dose of salvarsan, and continuing over a year on the following schedule:

1. Eight injections of gray oil, 0.10 to 0.15, fortnightly.
2. Eight injections of intramin, one to three cubic centimeters, every two weeks, alternating with the gray oil.
3. One month in every three months potassium iodid is given, starting after the fourth injection of intramin.
4. A month of rest following the eight injections of each, and repeat. Special methods are given for secondary lues, recurring late manifestations, myelitis, encephalitis, but the reviewer fails to see where the author has made a case, for with the same therapy, omitting the intramin, good results are usually obtained. J. S. W.

Treatment of Gonococcic Ophthalmia by the Vaccine of Nicolle and Blaizot.

Delorme (Le traitement d'ophtalmie purulente gonococcique par le vaccin de Nicolle et de Blaizot, *La Clinique d'Ophtal.*, May, 1916) mentions the various clinicians who have tried gonococcic vaccines within the past three years, quoting those favorable and unfavorable. It is very difficult to decide when the favorable results are due to serum, for frequent flushings were employed even when astringents were dispensed with. The author believes that complications are avoided and the acute symptoms subside under the use of the vaccine. Morax is skeptical, while Lagrange, Roche, and many others are injecting the serum in every case. Nicolle and Blaizot have obtained by special culture media a fixed nontoxic vaccine which is very efficient in epididymitis and specific arthritis. The trade name is dinegon, delivered in ampules and injected hypodermatically. J. S. W.

Contribution to the Study of Hemorrhagic Retinitis, Especially as to Etiology and Prognosis.

Amsler (Contribution a l'étude de la rétinite hemorrhagique, notamment de son étiologie et de son pronostic, *La Clinique d'Ophtal.*, May, 1916). This is a monograph published in Lausanne by the company "Art and Science." The term is used to denote those pathologic conditions induced by a preexisting disease of the retinal vessels. The statistics are compiled from one hundred and sixty-four cases in the private practice of Professor Eperon and his last five years in the hospital clinic. General consideration shows four cases of retinal hemorrhage to one thousand patients. Sixty-three per cent were women. Arteriosclerosis is the principal cause, with cardiopathies producing eight per cent, and albuminuria seven and one-half per cent. Glycosuria was found in only two to three per cent. The menopause, gout, obesity, pregnancy, influenza, all play a rôle, but tuberculosis is a factor of much importance, as is syphilis. The condition is more benign in women than men. The lesions are aggravated in men because of their less hygienic mode of life. Prognosis is worse when there is a thrombosis of the central vein, atrophy of the nerve or tremendous exudation without thrombosis. Recurrences are frequent.

The treatment should be a general hygienic one for the relief of the arteriosclerosis, as local measures have all proven very inefficient. The prognosis is favorable in forty per cent of all cases. J. S. W.

Lacrimal Swellings.

Jocqs (Sur la tumeur lacrymale, *La Clinique d'Ophtal.*, June, 1916) says that dacryocystitis is ordinarily due to retention of tears and subsequent infection. This may take the form of a simple catarrh, or become mucopurulent, with or without ectasia of the sac. The second period is when, after repeated acute attacks, the pericystic cellular tissue participates in the inflammation, either through the intact anterior wall or by perforation. The treatment is carefully described, and has been used for twenty years. The sac is left filled, or if empty is distended with fluid. Subcutaneous anesthesia. A deep puncture is made above the tendon of the orbicularis. A grooved director is passed to the bottom of the pouch, and the wall is split upon this guide. The cavity is then washed and packed with cotton for twenty-four hours. The sac itself is then syringed through the canaliculus, to see if the pouch communicates, which is frequently the case, for it may be possible to conserve the sac. The entire pericystic pouch is now cauterized with fifty per cent chlorid of zinc. In about eight days the eschar is removed by curetting, leaving a clear granulating surface, and packing lightly so as to have the area heal from within.

The author seems surprised that Gifford did not mention that his cauterization of the sac was not original, but an old procedure described and published in 1899. J. S. W.

Paraspecific Serum Therapy by Mouth in Ocular Infections.

FROGIER (De la sérothérapie paraspécifique par voie buccale dens les infections oculaires, *La Clinique d'Ophtal.,* June, 1916) writes a lengthy article upon the method of Roux, who advocated the use of sera of nonspecific nature. The action is merely a stimulating one, increasing phagocytosis and antibodies, and thus aiding in combating the disease.

The advantage of the oral route is that all anaphylactic symptoms are avoided and the method is absolutely safe. Accidents up to thirty-five per cent are quoted by authors who used subcutaneous or intravenous injections. It seems that the digestive ferments render the albumin incapable of producing anaphylaxis.

The following prescription is taken hourly for the first three days, and then every two hours for the following eight days: Serum antidiphtheritic, 10.0; syrup of raspberry, 30.0; water, 100.0.

Research, both clinical and experimental, has proven that absorption occurs in oral administration. The principal clinical sign is in the cessation of pain. Darier has found that serum injected directly into the veins relieves in one hour; injected subcutaneously, it relieves in three to four hours, while the safe method requires about eight hours. After this interval antibodies are to be found in the blood.

The clinical studies show that in membranous conjunctivitis, corneal ulcers, iritis with hypopyon, penetrating wounds, and in postoperative infections, most desirable results are obtained. In the latter condition, if the infection is taken before the fourth day, the prognosis is very favorable, and in about a month the vision is equal to that of a normal operation.

J. S. W.

Introductions to Ocular Therapeutics.

DARIER (Introduction à la thérapeutique oculaire, *La Clinique d'Ophtal.,* July, 1916) begins his new work with a chapter upon the importance of exact diagnosis before treatment, and divides the methods as follows:

1. Clinical diagnosis, consisting in a careful observation of all signs and symptoms, local and general, such as teeth defects and malformation. The use of all instruments of precision, the ophthalmoscope, campimeter, radiogram, thermometer, etc.
2. Pathologic anatomic examinations for bacteria and tissue changes, revealing the various specific causative factors.
3. Experimental diagnosis, obtained by transmitting disease to more susceptible animals.
4. Serologic methods, by provoking biologic reactions, as tuberculin tests, Wassermanns, blood cultures, and the Abderhalden reaction.
5. Therapeutic diagnosis, which is crude, but effective in many cases, as the relief of rheumatic conditions from salicylates, and the use of quinin in malaria. However, we must also fall back upon symptomatic medication, and relieve symptoms as they arise. Dionin, aspirin, or pyramidon for pain, blood depletions and other means at our disposal are indicated, even after the etiology has been determined. J. S. W.

Concerning the Pathogenesis of Cataract.

Jocqs (Sur la pathogénie de la cataracte, *La Clinique d'Ophtal.*, July, 1916) maintains that the subject is far from being solved, and that there are so many different varieties of lens opacities, that the same factors certainly do not hold good for all. Urra, Romer and the more recent writers upon the subject concur in the hypothesis that certain autocytotoxins floating in the blood have an affinity for lens tissue and finally produce the breaking up of the lens tissue by acting through a diseased ciliary body and changed epithelium of the anterior capsule. The lens is normally nourished by the osmotic exchange of fluids from the aqueous, but the epithelia act as a filter and allow only certain nutritive elements to pass. However, when the protection is changed by age or other influencing factors, deleterious matter gets entrance to the fibers and precipitates the proteins. Naphthalin cataracts are explained by this chemical's selective action on the epithelium, thus producing a faulty osmotic action. All these hypotheses are not very satisfactory, for we also know that diseases of the posterior segment of the globe are very prone to produce lens opacities, as in myopia, choroiditis, and detachment of the retina. J. S. W.

Ectogan in Ocular Therapeutics.

TERSON (L'Ectogan en thérapeutique oculaire, *La Clinique d'Ophtal.*, July, 1916) says that ectogan is a very pure peroxid of zinc frequently used in the treatment of wounds. As a dusting powder it is preferable to iodoform, because it is odorless and acts quite as well. It is used in one or two per cent ointments whenever a lubricant or disinfectant is desired for lesions of the cornea or conjunctiva. For skin irritations, eczemas, blepharitis, etc., the drug has proven very advantageous. Colorless and odorless, well incorporated with lanolin and vaselin, it makes an ideal preparation put up according to this prescription: Ectogan, 0.10 or 0.20; lanolin and vaselin, each 5.0. J. S. W.

Atropin Conjunctivitis.

TERSON (Sur la conjunctivite atropinique, *La Clinique d'Ophtal.*, July, 1916) had a case in which a half hourly instillation of a half per cent solution of atropin produced a tremendous edema of upper lid and forehead. If the atropin was continued, the swelling became greater; if discontinued, it subsided. Duboisin and scopolamin had the same influence, but mydriasis from cocain and euphthalmin did not produce any untoward effect. Another patient developed a severe follicular conjunctivitis covering completely the entire upper tarsus with granulations resembling a succulent trachoma. This subsided when euphthalmin was substituted for the atropin. J. S. W.

ABSTRACTS FROM SCANDINAVIAN OPHTHALMIC LITERATURE.

BY

WILLIAM H. CRISP, M. D., OPH. D. (COLO.),

DENVER.

A Case of Parinaud's Conjunctivitis.

STALBERG, K. (*Hygiea*, Vol. 78, p. 1214). A young woman of seventeen years developed symptoms of Parinaud's conjunctivitis, the symptoms being localized principally in the upper lid of the right eye. The pathologic diagnosis of the excised tissue was tuberculosis. A little while after the beginning of this ophthalmia the patient was attacked by erythema nodosum, which the author, in view of similar observations, suspects to have been due to the same origin. After reviewing recent publications on the subject, he expresses the opinion that the infection in question may depend on different microbic infections. As regards therapy, he proposes to employ in future in such cases the Finsen treatment.

An Eye Disease (Keratitis Exulcerans Perforans Traumatica) in Sharks and Rayfish in Captivity.

HENSCHEN, S. E. (*Svenska Läkaresällskapets Handlingar*, Vol. 42, p. 971). At the Kristineberg zoological station the author observed that a large number of sharks and rayfish living in the fish tank, which was placed in the sea, were attacked by an eye disease which did not prevent them from swimming about freely and without colliding with their companions. There were four stages of the disease: (1) A beginning stage of quite superficial keratitis; (2) a deeper stage with perforation of the cornea; (3) a stage of iris collapse following perforation; (4) exenteration of the contents of the eyeball, perhaps including the lens. The first stage began with a very superficial desquamation of the corneal epithelium, always appearing at the highest convexity of the cornea and extending towards the periphery.

The process was completed within a few weeks after the fish were placed in captivity. The fish became entirely blind, their apparent power of vision being due, in all probability, to the senses of smell and touch.

The cause of the disturbance was found by the author to consist in traumatic lesions due to their companions, especially on the part of the rayfish with their innumerable spikes and prickles. The eyes of the rayfish, which were naturally better protected than those of the shark, were affected to a much less extent. The fact that the condition was not due to a neuroparalytic keratitis was experimentally demonstrated.

The External Form of the Human Lens in Accommodation.

NORDENSON, J. W. (*Svenska Läkaresällskapets Handlingar,* Vol. 42, p. 1126). The present knowledge of the form of the surface of the lens in the condition of accommodation is derived from Tscherning and other investigators who worked more or less with him. Their views may be summarized to the effect that the anterior surface of the lens undergoes an increase of curvature at the center, and at the same time a considerable flattening in the peripheral portions during accommodation; and the difference of curvature between the center and the periphery is according to these workers so considerable that they speak of the formation of a lenticonus anterior. On the posterior surface of the lens the same changes are believed to occur, but to a lesser extent.

These views have been rather widely disputed. The method adopted by Nordenson for the investigation of the question at issue has been previously described (*Nord. Med. Arch.*, part 2, 1913). In an eye a meridian of the anterior and of the posterior lens surface was studied in relation to its curvature in accommodative rest, and also with an accommodation of 6.5 diopters; it being found that the curvature of both surfaces increases during accommodation, both at the periphery and in the center, and that both in the accommodating eye and also during accommodative rest the curvature is greater at the center than at the periphery.

SOCIETY PROCEEDINGS.

BY

ARTHUR J. BEDELL, M. D.,

ALBANY.

TRANSACTIONS OF THE SECOND COLORADO OPHTHALMOLOGICAL CONGRESS.

HELD UNDER THE AUSPICES OF THE COLORADO OPHTHALMOLOGICAL SOCIETY IN DENVER, COLORADO,
AUGUST 1 AND 2, 1916.

First Session, August 1, 1916. Dr. Melville Black presiding.

Dr. John A. McCaw, Denver, gave a demonstration of the Colloidal Theory of the Pathology of Glaucoma.

Dr. Valentine B. Fischer, Boulder, Colorado, read a paper entitled

Halos of Glaucoma—A Diffraction Phenomenon.*

JOINT DISCUSSION ON THE DEMONSTRATION GIVEN BY DR. MCCAW AND THE PAPER READ BY DR. FISCHER.

Dr. Joseph S. Lichtenberg, Kansas City, Missouri, reviewed the classification of colloids. According to the book by Fischer of St. Louis, not only do tissue fluids of the eye swell, but also every tissue of the eye; a difference thus existing between the facts of experiment and the facts of actual pathology. After tapping of the eyeball, with the resulting increase in the amount of albumin in the aqueous, why does the tapping not make the symptoms worse rather than better?

Dr. Lichtenberg had used sodium citrate in a number of cases, in the strengths recommended by Fischer, and if the tension was reduced for a few hours, instead of from three to six days, he felt himself lucky. Dr. Lichtenberg complimented Dr. Fischer of Boulder on his paper, as being the first scientific paper based on laboratory investigations on this subject which had appeared in this country. In addition to the factor of which Dr. Fischer had spoken, there was undoubtedly an edema of the substantia propria, which also entered into the formation of the halo.

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*See page 1.

Dr. Edward Jackson, Denver: With reference to the edema theory of glaucoma, the demonstration shows a fact pointed out by Rübel, that the swelling that occurs in an eye in acid solutions is very largely a swelling of the sclera. The colloids involved seem to be those of the sclera. Swelling of the sclera with an incompressible content will cause increase of intraocular tension directly; and by pressure blocking the vortex veins and other outlets, will tend to increase and perpetuate glaucoma from any cause. Glaucoma is a complex and varied condition, and light on it from any direction is important.

With reference to the halos of glaucoma: Their explanation as a diffraction phenomenon is the only scientific explanation that is worthy of consideration. The opacity causing the color rings is different from that of tension on the cornea, which may be caused without any observance of the halos. Fuchs pointed out that the halos depend on the deposit of minute droplets in a single layer between the corneal epithelium and Bowman's membrane. Treacher Collins experimentally produced such a deposit, and with it the colored rings of glaucoma.

Dr. Harry S. Gradle, Chicago, Illinois, read a paper on

The Blind Spot.*

DISCUSSION.

Dr. Frank R. Spencer, Boulder, Colorado, said that Peter's new hand campimeter appealed to him as a more useful and accurate method of measuring the blind spot than Gradle's screen, although one could do good work with either. The distance of the test object, viz., 16.5 centimeters from the patient's eye, will enable the examiner to do the best work. The sharp cut separation between the amblyopic and normal retina is more definite and more accurate at this distance. Furthermore, qualitative color changes are recognized more readily.

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*See page 740, Vol. XXV, 1916.

Dr. Spencer quoted extensively from Peter's articles as to the size of the blind spot, the use of his apparatus, physiologic variations in the size of the blind spot, etc.

As regards the abnormal blind spot, Dr. Spencer believed that in many cases of accessory sinus disease, in which the optic nerve was involved, the disease was spread by continuity of tissue, as from the sphenoidal and posterior ethmoidal sinuses, so that direct pressure upon the nerve from confined pus might be, and often was, more important than an edema; and that the more advanced cases had passed beyond the stage of edema in or about the optic nerve. This accounted more fully for the involvement of the papillomacular bundle, with loss of central vision, as in the case which he presented last year before this Congress. The majority of cases in which the blind spot shows an enlargement are doubtless directly or indirectly due to nasal or accessory sinus disease. On the other hand, rhinologists have for some time recognized the fact that the sphenoidal and posterior ethmoidal disease need not be purulent.

One disease, viz., angiosclerosis of the retinal vessels, theoretically should and probably does produce an enlargement of the blind spot. So far as Dr. Spencer knew, no one had attempted to measure the blind spot in early angiosclerosis. This additional means of diagnosis in all cardiovascular diseases should be utilized.

Dr. Edward Jackson, Denver: The enlargement of the blind spot is a matter of practical importance, so that accurate measurements of the blind spot, normal or pathologic, and methods of obtaining them may well occupy our time and attention. Dr. Jackson had not used the excellent but perhaps somewhat formidable apparatus of Dr. Gradle. He had used a modified Bjerrum screen, a black curtain at a distance of one meter with a test object consisting of a white bead five millimeters in diameter, suspended by a black thread that was quite invisible. When the position had been ascertained in which the bead disappeared, the distance was measured from the fixation point on a tangent scale. Dr. Jackson's measurements of the blind spot corresponded closely with those reported by Dr. Gradle. A week previously the finding of a blind spot that was not enlarged had proved important as negative indication of the character of an impairment of vision, which included a relative central scotoma without objective symptoms.

Dr. H. Moulton, Fort Smith, Arkansas, suggested that, in taking the field for the blind spot, in the absence of a magnet to control the test object, one might fasten a small bead to the middle of a fine thread a foot or two long, stretched between the ends of a steel bow. The bead would thus be kept from oscillating, and the ends of the bow would not come within the part of the field being tested. The bow could be held by a handle attached to its middle.

Dr. Harry S. Gradle (closing) remarked that his apparatus did not take up more space than an ordinary kitchen table. The Peter's campimeter is not reliable on account of its small size, as slight enlargements cannot be detected. Dr. Jackson's arrangement will take as much time as Gradle's, although, of course, not calling for the size of apparatus. Enlargement of the blind spot is certainly of importance. Not every case of accessory sinus disease will show enlargement of the blind spot, nor will every case of enlargement of the blind spot indicate accessory sinus disease. Yet enlargement of the blind spot will often call attention to cases of accessory sinus disease which would otherwise escape notice.

Dr. Fred Stauffer, Salt Lake City, Utah, read a paper entitled

The Causal Relationship of Deformities and Diseases of the Nose and Throat to Diseases of the Eye, With Special Reference to Asthenopia.*

DISCUSSION.

Dr. H. Coulter Todd, Oklahoma City, said that the causative relationship between eye diseases and nose and throat pathology, also between eye disturbances and intranasal irregularities, such as deflected septa, hyperplasias, spurs, etc., was no longer a conjecture or theory, but an approved fact. This question was coming to receive wide attention, and while he did not think for a moment that the time is coming when all the ophthalmologist would need to do was to make an examination and then refer his patient to a nose and throat specialist, he did believe that the progressive and most successful ophthalmologist would set aside all prejudice and accept such observations and investigations as Dr. Stauffer's at their face value.

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*See page 13.

The various eye disturbances which may be directly related to nose and to throat conditions are direct infections due to the transmission of toxins through the blood and lymph channels, the spread of disease by direct contiguity of tissue, and various reflex and vasomotor disturbances.

A young man, aged twenty-three years, came to his office and gave a history of having had a marked redness of the bulbar conjunctiva ever since childhood, the condition occurring every three to six months, and lasting from one week to a period of three or four weeks. The condition caused positively no physical distress, and the patient recognized his trouble only by observing himself in a mirror.

The chief disturbance which this condition caused the patient was the unsightliness. He had been refracted by many ophthalmologists without beneficial results. Just prior to seeing this case the speaker's attention had been called to the various reflex and vasomotor disturbances in the eye due to some cause within the nose.

Upon a rhinologic examination of this patient, he found most marked deformities causing irritation of and pressure upon the Schneiderian membrane.

By proper intranasal operation to completely relieve this condition, he was gratified to bring about permanent relief. It is over two years since he operated upon this patient, and he has not had a return of the trouble since that time.

Dr. H. Moulton, Fort Smith, Arkansas, said that nasal disease was more apt to be overlooked in children than in adults who complained of asthenopia. A school girl of twelve years was brought for glasses. She had only 0.75 D. hyperopia. Purulent ethmoiditis was discovered and removed by operation, with relief of all the symptoms.

Dr. H. W. Thompson, Pueblo, Colorado: The man doing nasal work is apt to lay more stress on the nose than on focal disease elsewhere—for instance, in the mouth or alimentary canal. The tonsils play an important part in various eye conditions, such as keratitis.

Dr. T. L. Higginbotham, Hutchinson, Kansas, after removing inflamed tonsils, had seen secondary conditions of the eye clear up in six hours. Rheumatism was not a cause, but merely a symptom of a real cause which needed attention.

Dr. James M. Patton, Omaha, Nebraska: We are sometimes disappointed when a patient comes back from the rhinologist as bad off as when he was first sent to him, and the reason for this is that we sometimes fail to discriminate between the symptoms which should lead us to have him consult a rhinologist and those which should direct us toward some other line of investigation.

There are a number of questions which we should settle before referring them to a rhinologist for an examination—e. g., are the symptoms which the patient complains of worse in the morning when he arises than later on in the day? Is he worse on cloudy or damp days? Are the symptoms aggravated by catching cold or stooping over? If this is the case, the chances are that some intranasal interference will be of benefit.

In cases where we are considering optic neuritis and optic atrophy, we should determine as to whether or not the patient has any nasal history, or whether there was any history of recent colds or sinus trouble previous to the appearance of the ocular symptoms.

If any of the above conditions are present, it is quite possible that some nasal interference will be of benefit. If they are absent, it would be better for us to look to some other explanation for the cause of the trouble.

Dr. George L. Strader, Cheyenne, Wyoming, referred to a method of diagnosis which he had employed. After the use of a weak solution of cocain, and suction for a few minutes, an ichthyol tampon was left in the nose for twenty-five or thirty minutes, a string being tied to the tampon so that the patient could take it out.

Dr. Harry S. Gradle, Chicago, had seen only two cases in which the primary connection between the nose and eyes was visible. In the first, a suppurating carcinoma of the antrum penetrated the orbit, and caused an abscess of the optic nerve. In the second, suppuration of the anterior ethmoidal cells was complicated by rupture of the orbital wall subperiosteally, with the resulting development of intermittent unilateral exophthalmus.

The indirect connection between disease of the eye and disease of the nose is of course a clinical entity and needs no discussion. But Dr. Gradle had not seen the reflex between the nose and the eyes resulting in local hyperemias such as were spoken of. The majority of these would prove to be localized affairs, and could usually be relieved by local treatment. Thus a low grade Morax-Axenfeld infection would frequently be mistaken for hyperemia of nasal origin.

Lastly it must not be forgotten that the primary etiologic factor in ocular disease is syphilis, and we must not be diverted from this by any fads.

Dr. John H. Schrant, Hutchinson, Kansas, failed to see the connection between the focus of infection somewhere else and the eye. If you looked carefully enough in these eye conditions, you would find that the trouble was situated in the eye itself.

Dr. Joseph S. Lichtenberg, Kansas City, Missouri, had been consulted three months ago by a physician apparently healthy, with retinal changes. He had chronic nephritis, of which he had since died. A few days later he brought in his young boy with an almost typical star-shaped area at the macula. A thorough general examination was entirely negative, with the exception of a pair of purulent tonsils, and removal of these by a local rhinologist led to a good recovery.

The morning headache, due to retention of secretion in the sinuses, is a very important symptom.

Dr. W. H. Crisp, Denver, Colorado, referred to a case an account of which he had published in the *Ophthalmic Record* for 1914 (p. 180), in which a severe ocular condition, including corneal disturbance, which had persisted for many years under the repeated diagnosis of trachoma, cleared up rapidly and permanently after correction of pronounced nasal deformity due to an injury in childhood.

Dr. Marcus Feingold, New Orleans, Louisiana, gave a lantern demonstration of microscopic slides showing intraocular sarcoma and glioma.

Second Session, August 2, 1916. Dr. Joseph S. Lichtenberg presiding.

Dr. Harry S. Gradle, Chicago, Illinois, demonstrated the Mellinger inner pole hand magnet.

Dr. Edward Jackson, Denver, Colorado, described a new form of international test card, consisting of the "broken ring" arranged on a symmetrical card, and intended for use at varying distances from the patient.*

Dr. Melville Black, Denver, Colorado, demonstrated (1) a cataract knife the handle of which was bent in a double right angle, to facilitate its use under difficult conditions such as were presented by an unusually deep orbit; (2) a new canaliculus knife.

Dr. W. H. Luedde, St. Louis, Missouri, demonstrated (1) a new form of scissors for slitting the punctum, having straight blades, one of which terminated in a dilator point; (2) a fixation object for the Gullstrand ophthalmoscope.

Dr. Harry L. Baum, Denver, Colorado, read a paper entitled

Intranasal Operation for Lacrimal Obstruction, With Simplified Technic.†

DISCUSSION.

Dr. H. Moulton, Fort Smith, Arkansas, said that the operation appealed to him as entirely feasible and simple. It did not involve extensive dissection within the nose; the opening was made with the smallest possible amount of mutilation within the nose, and it looked as though the great majority of these cases ought to have permanent results. A free opening from the nose was preferable to a permanently infected and dilated sac.

Dr. Melville Black, Denver, Colorado, had asked Dr. Baum two winters ago to operate upon several clinic cases for him. The results had been most satisfactory in these cases, and so far permanent. The description of this operation sounded more or less formidable, but when the performance was watched it looked very simple.

Dr. T. L. Higginbotham, Hutchinson, Kansas, had had satisfactory results in five cases by means of an operation in which a small punch was carried from the sac into the nose.

Dr. Fred Stauffer, Salt Lake City, Utah, asked concerning the results as to epiphora. The epiphora in these cases was only due to the irritation from the infected sac. Did the membrane of the sac resume its normal condition, so that the epiphora was done away with?

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*See page 22. †See page 25.

Dr. Harry S. Gradle, Chicago, Illinois: The drainage from the conjunctiva through the sac was by capillarity, and also by the closure of the lids; first by negative, and then by positive pressure of the lids on the sac. The West operation had given a large percentage of failures. The use of syringing and other local measures would in a great many cases maintain the integrity of the sac and the pump action for removal of the tears, which was the main thing.

Dr. J. M. Patton, Omaha, Nebraska: The normal drainage of the eye is the main thing to be secured. It is sometimes necessary for other surgical reasons to do something to destroy the sac. We always regret having to destroy the sac, because it leaves a watery eye, although a safe one. Thus the operation described by Dr. Baum presents decided advantages over other procedures that have been suggested.

Dr. B. A. Filmer, Colorado Springs, Colorado, referred to an instrument which Dr. Neeper of Colorado Springs had devised several years ago, consisting of a punch for passing from the sac towards the nose.

Dr. Harry L. Baum (closing) said that, not being an ophthalmologist, he was not qualified to determine whether the intranasal operation should be performed, but was prepared to do the operation when ophthalmologists so requested. He did not claim originality as to the operation, which was merely a modification of the West, Toti, and other operations. He thought the operation would be found to be successful if the various small details were given careful consideration. The operative procedure itself was comparatively simple. It did not take over ten minutes, including the application of novocain. The after-treatment was important. If the applications of silver nitrat were neglected, there would be closure in a number of cases. The epiphora had cleared up in all the cases in which Dr. Baum had done the operation, except in one case in which the Gifford operation had been done first. Although the operation in this case was itself successful, and the healing was excellent, there was a small amount of epiphora afterwards, probably due to the formation of a good deal of granulation tissue.

The operations that had been mentioned as working from the eye into the nose had one objectionable feature—namely, that if the flap of mucous membrane separated was not larger than the operative area (the amount of bone to be removed), there would be a proliferation of the connective tissue which was likely to cause closure.

Dr. Marcus Feingold, New Orleans, Louisiana, read a paper entitled

Fuchs' Coloboma With a Loop of Retinal Vein Hidden Behind Fold of Retina.*

DISCUSSION.

Dr. E. T. Boyd, Denver, Colorado, regarded the condition described and illustrated by Dr. Feingold as one of anomalous coloboma of the choroid, occupying an unusual position for such a coloboma.

Dr. Harry S. Gradle, Chicago, Illinois, had had an opportunity in the past winter of studying two cases of this kind, in one of which the blind spot was thirty degrees from the normal, representing the tilting of the disc.

Dr. W. H. Luedde, St. Louis, Missouri, asked Dr. Feingold how he determined that the retina went across and did not fully line the depression.

Dr. Marcus Feingold (closing): No satisfactory explanation has so far been given for the peculiar shape of the disc in cases of conus below. But one of the factors contributing to the peculiarity of the disc in this individual case may have been the marked astigmatism of the fundus in this region, as distinctly seen with the binocular Gullstrand. With this the disc and the region below appear as if situated in a plane placed through a frontal axis and tilted forward at its upper end, making the upper end appear much nearer and the lower one much farther back. In order to avoid misunderstandings it will be well to emphasize that the astigmatism of the fundus was limited to that particular region only, and that the macula especially did not share in it, as proven by the excellent vision of the patient. In the diagrammatic section placed through disc and surroundings at the point demanded by Dr. Gradle, the portion of the retina lying over the staphylomatous sclera can be imagined to be lying in contact with it or to extend in a straight line from the margin of the disc to the depth of the fold; this latter interpretation was adopted to emphasize the pulling down of the fold. In such case we should have to assume that some kind of fluid would occupy the space between the staphyloma and retina.

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*See page 34.

In the older literature, especially in Fuchs, is the statement that the low vision of these patients is due to the fact that they have an astigmatism of the fundus. Examination of this case with the Gullstrand binocular instrument showed the disc tilted, instead of being placed on a level with the retina. But this patient has no astigmatism of the macula, having 5/3 vision. I cannot positively state that the retina is actually hollow, but I assume it as being the more probable.

Dr. William H. Crisp, Denver, Colorado, read a paper entitled

Combined Use of Cross Cylinder and Astigmatic Dial.*

DISCUSSION.

Dr. W. M. Bane, Denver, Colorado, had felt that the cross cylinder was the accurate and reliable test for astigmatism, and if in the clinic he happened to be without the cross cylinder, he felt that he must go over a patient again with it. If a patient selected a particular line on the clock dial as more prominent, he used that as an approximate starter as to the axis of the cylinder, and tried a plus or minus 0.50 cylinder in that axis, using whichever the patient selected. When he had finished the test he again asked the patient as to the dial as a final check.

Dr. Edward Jackson, Denver, Colorado: It is worth mentioning again that the handle of the cross cylinder must be exactly at 45° with the axis of the cylinder, as manufacturers often put out the axis to coincide with the handle. Since Dr. Crisp had mentioned to him the combined use of the tests, Dr. Jackson had used the method in some of his more difficult cases, and believed it to be of value. The letters are at times at fault, because the patient may fix his attention upon lines of different direction.

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*See page 42.

Dr. Melville Black, Denver, Colorado: We all have our own way of refracting that gives satisfaction. My method is in plus errors to correct with a sphere the meridian of greatest error of refraction. This overcorrects the lesser meridian, and the meridian is to be cleared up or corrected by minus cylinders. When the dial is equalized you are at the end of your test, except the fine adjustments incident to perfect vision. Can anything be more simple than this? The use of the crossed cylinder has always confused me, probably because I do not know how to use it.

Dr. John A. McCaw, Denver, Colorado, thought that the difficulty some had with the cross cylinder was that they tried to think out in detail what was going on in front of the patient's eyes, whereas all that they needed to do was to get the patient to select one side or the other of the cylinder and move the lens accordingly.

Dr. Joseph S. Lichtenberg, Kansas City, Missouri, having had trouble with the slipping of the cylinder, had adopted Dr. Stevenson's method of marking the cylinder—a line with a red or white dot indicating the plus and minus axis. He did not consider a case finished unless he had used the cross cylinder.

Dr. William H. Crisp (closing) suggested that the best way to get a clear understanding of what the cross cylinder did in changing the axis was to lay two cylinders out of the trial case upon one another, with their axes not coinciding, and then to study the way in which vertical or horizontal lines were broken on looking through the two lenses.

Dr. Henry M. Thompson, Pueblo, Colorado, read a paper entitled

Treatment of Cataract During the Earlier Stages.*

DISCUSSION.

Dr. B. A. Filmer, Colorado Springs, Colorado: There is no question that cataract is essentially a pathologic rather than a physiologic condition, and as such may respond to medical treatment in its earliest stages. Just how much can be accomplished is at the present time uncertain. A number of investigators have demonstrated that incipient cataract may be more or less relieved by the use of a number of remedies given for constitutional effects or employed locally by instillation into the eye, by subconjunctival injections, or as eye baths; or a combination of these methods is used. It seems rational to believe that the successful treatment will result from a combination of the constitutional and local methods; since the causes of cataract are both local and constitutional. The best line of procedure in each case must be determined after a careful physical and laboratory examination of the patient, oculist and family physician working jointly.

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*See page 47.

Treatment must aim to put the whole system in as healthy a condition as possible. This is especially true of the excretory organs, the digestive tract, teeth, tonsils, and nose. Strict attention must be paid to any diseased conditions of the eye, and not only must the eyes be properly refracted and fitted with glasses, but the patient must receive instruction as to the proper care and use of his eyes.

However, progress must necessarily be slow, for it will take time to teach the laity and a large part of the medical profession that it is no longer necessary to wait for a beginning cataract to progress to the operative stage before treatment is begun. We may realize how deeply rooted is this idea of noninterference when we recall that a prominent ophthalmologist in his book, printed twelve years ago, gave the treatment of cataract as removing the opaque lens.

Then, too, of those who seek advice at an early stage, few are willing to submit to a prolonged treatment more or less uncertain in results.

Dr. T. L. Higginbotham, Hutchinson, Kansas: The earlier diagnosis of incipient cataract is at fault becaues men do not recognize opacities until the vision is very low. Cataract is most common in the dental pyogenic stage of life, and no treatment in the world will obliterate incipient cataract unless you do away with the pyogenic basis.

Third Session, August 2, 1916. Dr. H. Moulton presiding.

Dr. Edward Jackson, Denver, Colorado, read a paper entitled:

Cycloplegics in the Measurement of Ametropia.*

DISCUSSION.

Dr. C. A. Ringle, Greeley, Colorado: The work of refraction depends in large measure upon the personal equation of the individual who is doing the work. Before undertaking to refract under a cycloplegic, the eyes are to be thoroughly examined with the ophthalmoscope and in other ways to make sure that glaucoma is not present.

Dr. Frank R. Spencer, Boulder, Colorado: Atropin is best in small children, because of the difficulty of obtaining complete cycloplegia. Personally he preferred the use of hyoscyamin in adults, because it requires a shorter time for use and a shorter time for recovery, besides giving excellent cycloplegia. Homatropin has always been of very doubtful value in his hands, giving imperfect relaxation of the ciliary muscle.

In all cases of refraction the keratometer, skiascopy, and subjective tests should be employed, and also the cross cylinder.

Dr. H. M. Thompson, Pueblo, Colorado, did not believe that in the majority of cases it was possible to get a definite finding under forty years of age without the use of a cycloplegic.

Dr. Marcus Feingold, New Orleans, La.: The advantages and disadvantages of cycloplegics have been so clearly and impartially outlined by Dr. Jackson that one cannot but approve of these rules in all details. Unfortunately, all this applies only to ideal conditions, and in practice we shall therefore often be compelled to use cycloplegics when, given ideal conditions, such as time, cooperation of the patient, etc., we could, guided by the principles laid down, have gotten along without them. In one class of cases though, he would like to see cycloplegics used more often than recommended by Dr. Jackson. He meant presbyopes. The slight extent of the inconvenience felt by these patients after the use of cycloplegics is a matter of daily experience with the oculist, and therewith falls one of the contraindications to the use of these drugs. On the other hand, cycloplegics, through their mydriatic action, will allow a thorough inspection of fundus and media, and thereby give occasion to discover diseases in their early incipiency, such as opacities of the lens at the lower nasal margin, vesicles in the cortex, and changes in the retina and vessels foreshadowing arteriosclerosis and kidney trouble.

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*See page 56.

Dr. Wm. H. Crisp, Denver, Colorado, suggested that each case should be considered by itself, it being, for example, occasionally possible to omit the use of a cycloplegic even in persons below the age of thirty years. The practice of fogging both eyes at the same time, instead of covering one eye while the other was being tested, would be found a very material addition to the technic of refraction.

Dr. Harry S. Gradle, Chicago, Illinois: We must unquestionably always use a cycloplegic under eighteen years of age. From eighteen years to the presbyopic age, cycloplegia may be necessary, but with careful work is often not essential. Cycloplegia is not necessary in presbyopia. Even under cycloplegia, refraction is not necessarily a mathematical problem, but includes guesswork, both subjective and objective.

Dr. Joseph S. Lichtenberg, Kansas City, Missouri, thought we did not today use the ophthalmoscope in the estimation of refraction as much as we should. By having the dark room sufficiently long we can get the patient to relax more completely, and where definite relaxation is thus obtained, it may be decided that a cycloplegic is not necessary.

Dr. David H. Coover, Denver, Colorado: An old test which should not be forgotten is the stenopeic disc, with which Dr. Coover's results had been very good, even without the use of a cycloplegic. We should use a cycloplegic in all cases in which there is any muscular trouble. Cycloplegics could be abused, and probably were abused in a great many cases. As regards the choice of a cycloplegic, Dr. Coover preferred homatropin, because his experience with duboisin and hyoscin had been unfortunate. With the former the first patient was in his office from early morning to late at night, as the result of bad poisoning.

Dr. Henry Moulton, Ft. Smith, Arkansas: It is desirable to be familiar with all the methods of working without a mydriatic, because one sometimes cannot use a mydriatic when he ought to. He mentioned a case in which glaucoma had developed after the use of homatropin in his own practice. The day after the solution of homatropin was instilled the patient went to her home. She consulted her own doctor, who diagnosed conjunctivitis, and gave her atropin and argyrol. At the end of a week she had a very advanced glaucoma, with very slight vision. Iridectomy, done the following day, resulted in vision of 20/40 and 20/50, the fields being moderately contracted.

Dr. Edward Jackson (closing) said in myopes he used a cycloplegic more frequently than in hyperopes of the same age. If they come back requiring a change of lenses, it is likely to be for an increase of myopia accompanied by inflammatory changes in the choroid, constituting a second reason for cycloplegia. Then the myope, like the presbyope, suffers comparatively little inconvenience under cycloplegia. As to the use of cycloplegics after fifty: The paper referred to the use of these drugs as cycloplegics, not as mydriatics. It is very often advisable to use a mydriatic after the age of fifty. Probably in twenty per cent of refraction cases after fifty he uses a mydriatic. Probably they should be used more frequently. When a presbyope comes to an oculist rather than the optician for glasses, he should have the benefit of a careful ophthalmoscopic examination. The presbyope is likely to ascribe impairment of vision to age, and to think it inevitable. But the ophthalmoscopic examination may reveal cortical opacity of the lens, slight lesions of the macula, or changes indicative of angiosclerosis, and the patient will be greatly benefited by their early recognition.

On behalf of Dr. Wm. C. Finnoff, Dr. T. E. Carmody read a paper entitled

The Relation of the Mouth to Ocular Diseases.*

(Illustrated by lantern slides.)

DISCUSSION.

Dr. W. A. Sedwick, Denver, Colorado, reported the following case, suggesting incidentally that the ophthalmologist should not be dismayed because the dentist or the roentgenologist returned his patient to him with the verdict that the teeth or sinuses were not at fault.

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*See page 66.

Miss E., twenty-nine years of age, stenographer, first seen August 6, 1909, gave the following history: Had had trouble with her eyes for years, yet general health fair. Had had styes, watering, burning, headaches, diplopia, blurring of objects, some stomach trouble, quite nervous and becomes sleepy with heavy lids shortly after use of eyes for near work.

Vision O. D. = 20/30; O. S. = 20/40. With correction, vision O. D. = 20/20 —; O. S. = 20/20 —. Fundi normal. Media clear. Pupil left eye larger than right eye. Accommodation normal. Convergence minus. 1° L. hyperphoria.

She was comfortable for a while, but returned in a few months with about the same symptoms, plus a "jumping" of left eye, and at times something would seem to "snap" and the eye would become "blood shot." This eye was slightly proptosed and in a higher plane than the right. Pulse 66, and the girl seemed sick. No change could be made in the refraction. There was a slight swelling in the lower lid and over left antrum. Dr. T. E. Carmody saw the case in consultation. Transillumination showed sinuses apparently clear, yet the patient complained of a great deal of pain in the side of the face, in the eye and temple. In spite of treatment to nose, and generally, she became worse and was confined to bed with chills and fever, morphin being necessary for relief of pain.

Her dentist was sent to examine her teeth, and reported negatively. After a week or ten days she was able to resume work, but very half-heartedly.

She continued this way for several months, when she had to give up her work, having lost many pounds, suffered several relapses of "neuralgia" and proptosis, causing a complete nervous breakdown. She was sent for a two months' trip by land and sea. Upon her return she had gained several pounds and felt very well; headaches, etc., had all disappeared.

This did not last long, however, and soon she was in about the old condition, with tonsillitis, laryngitis, chronic appendicitis and a return of the "neuralgia" and "popping" of the eye. She declared that something had to be done, and was again sent to her dentist with reference to a special tooth. His report was the same as before, with the added remark that "your specialist is off in his upper story," and he refused to pull the tooth.

Feeling that her dentist's "upper story" may have been the one wrong, I insisted upon her going to another one, and asked that he examine the tooth. This he did, and said he could treat the tooth and preserve it, but he was not sure that the tooth had anything to do with the condition of the face and eye. Having suffered enough, the patient requested that the tooth be pulled. This was done, and a small abscess found at the root, which, by the way, projected into the antrum.

An immediate recovery was made and the patient has remained free from trouble to date.

Dr. J. M. Patton, Omaha, Nebraska: We can scarcely say that any examination in a case of uveitis or even keratitis can be considered satisfactory without at least eliminating the teeth as an etiologic factor.

Dr. Frank R. Spencer, Boulder, Colorado: Beck has suggested a galvanic current of one to three milliamperes for testing diseased teeth, pain being elicited if disease is present. Dentists too often return a negative report when we know a positive report should have been returned. Dentists should be physicians first and specialists in dentistry second.

Dr. Melville Black, Denver, Colorado, read a paper entitled

Procedures That Have Stood the Test of Time.*

This paper was informally discussed around the dinner table.

Wm. H. Crisp,
Secretary.

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*See page 73.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Regular meeting, held Monday, October 16, 1916. Dr. William E. Gamble, the president, in the chair.

Retinitis Proliferans.

Dr. E. K. Findlay reported a case of retinitis proliferans and exhibited the patient, demonstrating the progress within one year.

Discussion.—Dr. Harry S. Gradle asked Dr. Findlay whether, at any time, he had noticed the presence of hemorrhages either into the retina or vitreous.

Dr. Findlay replied that the hemorrhages were only in the retina; that large areas of hemorrhages were seen around the disc. There were also hemorrhagic masses in the vitreous.

Dr. Gradle thought the case should be classed as one of exudative retinitis rather than retinitis proliferans. He thought it was Koch who pointed out that retinitis proliferans is due to the proliferation of the glia, whereas in the exudative form there is connective tissue and organized exudate. He believed it was Nogouchi who claimed that this form of exudative retinitis is either the result of hemorrhages into the retina, or the vitreous impinges upon the disc and from the disc there arise new strands of connective tissue in the retina itself; consequently, he thought the case reported by Dr. Findlay should be classed as exudative retinitis rather than retinitis proliferans.

Dr. Findlay said he preferred the term retinitis hemorrhagica hyperplastica, which covers quite the same thing as Dr. Gradle had referred to. The condition was entirely due to hemorrhages. There was a proliferation of Mueller's fibrous cell and the formation of connective tissue.

The interest in the case to him was largely on account of the difficulty in finding any causal factor in a man in such a healthy condition as the patient was.

Dr. William E. Gamble had been observing this case in the last year, and his judgment is that the connective tissue in the eye was not the result of hemorrhages. There was too much connective tissue and too little hemorrhage, and then it did not seem to spread from the hemorrhagic areas or exudate plexuses.

Report of a Case of Juvenile Taboparesis With Optic Atrophy, Treated by Injections of Mercury Into the Lateral Ventricle.

Dr. George F. Suker reported Miss P. F., aged sixteen years, who contracted lues from her father while a baby but a few months old. Father contracted an active lues a short time prior. Mother is free, as a Wassermann and spinal fluid were negative.

The girl grew up, having had the usual sicknesses of childhood, and apparently gave no symptoms of lues to speak of, at least, the mother said the child was well until about the age of fifteen. Has menstruated but twice. Has a myopia of four diopters in each eye. Is rather small for her age, though both parents are tall. Gives no evidences of any pituitary disturbances; X-ray plates negative.

At the age of fifteen she began losing sight rapidly, became nervous and irritable, forgetful, and showed difficulty in walking, very dizzy, and had very severe headaches and more or less lancinating pains.

A complete neurologic examination by Dr. L. Harrison Mettler proved her to be a juvenile taboparetic, giving all the classical symptoms.

The eye findings are as follows: 1. Maximumly dilated irides. 2. Moderate degree of divergent strabismus. 3. Complete optic atrophy in left eye (primary). 4. Rapidly advancing optic atrophy in right (primary). 5. Four diopters myopia in each eye; this gave 12/60 vision in right eye. 5. The field for form and color, just prior to operation, is as per charts.

On May 29th the right lateral ventricle was tapped and ten cubic centimeters of fluid slowly withdrawn; five cubic centimeters of this, with 1/100 grain of bichlorid of mercury, were slowly reinjected. (Luer syringe used.)

No marked reaction followed this injection; operation under general anesthetic.

After forty-eight hours the headaches disappeared and have not returned up to date. The dizziness rapidly improved. General conditions satisfactory. Second injection (under local anesthesia) ten days later; this time one-seventy-fifth grain of mercury in one-half of the amount of ventricular fluid (eight cubic centimeters) withdrawn was reinjected. Reaction rather pronounced within twenty-four hours—i. e., headache and dizziness; this lasted for but twelve hours.

Third injection two weeks after the second, and this time one-fiftieth grain mercury was injected. Reaction more pronounced than after second, but the continuous application of an ice bag to the head allayed all symptoms.

Fourth injection ten days after third, and one-twenty-fifth grain mercury was used. Reaction prompt and rather severe, but controlled as before.

Up to date the vision in right eye is the same (12/60) and the field larger (see chart) and more regular than before injections were made.

The patient is greatly improved in every respect, and after five months vision has not decreased any, though before injections were made vision rapidly fell to 12/60.

It must also be stated that inunctions of mercury have been consistently used in large doses since the last injection.

One cannot expect a restoration of nerve fibers in an optic atrophy, but if the atrophic process can be checked, some vision can be saved, and much has been accomplished.

One interesting feature in the case is the dilatation of the irides instead of an Argyll-Robertson pupil. The mother said the pupils were large for a number of years before she began to complain of headaches and dizziness, etc.

Following the lateral ventricle injection the reactions sometimes are very pronounced, within twelve to twenty-four hours after, necessitating a spinal puncture and the withdrawal of about ten to fifteen cubic centimeters of the fluid. The reactions may manifest themselves as terrific headaches, nausea, extreme dizziness, or more or less stupor. If the application of the ice cap to the head does not mitigate the symptoms promptly, then resort to spinal puncture.

Discussion.—Dr. Francis Lane asked Dr. Suker whether he regarded this as a primary ascending or descending atrophy of the optic nerve.

Dr. Suker said the question whether it was a primary ascending or descending atrophy of the optic nerve was very pertinent. Speaking of primary optic atrophy, we have it starting in the retina and ascending. If we accept the presence of the spirochete, although not yet demonstrated, in the nerve fibers posterior to the optic nerve itself, then we must look upon the spirochete as setting up a local low-grade inflammatory condition, and it might be a descending instead of an ascending optic atrophy.

There was no doubt in his mind that the direct injection of mercurial preparations or salvarsan, or neosalvarsan, had a definite field of value. This was not the only case he had had under his care. He recalled three cases in which the patients did not lose any more vision than at the time he first observed them. The oldest one was practically nine months. In nine months optic atrophy usually showed a marked advance, and if one could check it for nine months, it might be checked for a much longer period.

Tuberculosis as a Cause of Iritis in Eight Cases.

Drs. E. V. L. Brown and Ernest E. Irons stated that these cases were encountered during an intensive study of the etiology of one hundred cases of iritis (*Journal American Medical Association,* June 10, 1916).

In addition to these eight cases, clinical evidence of the presence of tuberculosis, either inactive or active, was found in twenty-six others of the one hundred cases. This evidence varied in extent and nature in the several cases; in twenty-four a rise of fever of more than one degree, either alone or accompanied by local and general signs of tuberculin raction, followed the injection of tuberculin; in one there were signs of cavity formation and infiltration, together with roentgenographic findings and an old history of tubercle bacilli in the sputum; another patient died later of pulmonary tuberculosis and diabetes. In all these twenty-six cases careful studies showed other infectious processes which appeared to the writers to stand in closer etiologic relation with the iritis than did the tuberculous infection. They warn strongly against basing a diagnosis of tuberculosis on incomplete clinical information or on placing great reliance on the presence or absence of a tuberculin reaction unsupported by collateral evidence. They pointed out that in some of the one hundred cases there were several infections occurring together, such as tuberculosis, syphilis, gonococcal or other pyogenic infections, in which careful investigation failed to demonstrate to their satisfaction which one of the possible causes was responsible for the disease in the eye. On the theory of probabilities, one or more of these cases may have been due to tuberculosis, but should not be included with the eight cases described, in which the evidence seemed fairly clear cut.

Case 29.—Machinist, aged twenty-three years. Active plastic iritis; active pulmonary tuberculosis. Roughness of breath sounds; dullness and fine rales over the upper lobe of the left lung both anteriorly and posteriorly; hemoptysis; tubercle bacilli found in the sputum. Lues denied. Gonorrhea three years ago.

Case 23.—Housewife, aged thirty-five years. Recurrent plastic iridocyclitis (fourth attack). Inactive pulmonary tuberculosis. Harsh right apex; relative slight dullness; X-ray findings "similar to pulmonary tuberculosis." Temperature of 100° twenty hours after subcutaneous injection of three milligrams of old tuberculin; repeated phlyctenula-like efflorescences about the limbus during tuberculin (B. E.) treatment. Repeated Wassermann and Neisserian complement fixation tests negative. Teeth, tonsils and sinuses negative.

Case 30.—J. R., laborer, aged twenty-four years. Iritis peracta, secondary cataract, inactive pulmonary tuberculosis. Breath sounds harsh and prolonged over the rigth apex and left subcapsular region; X-rays "quite characteristic of pulmonary tuberculosis"; ten weeks persistently subnormal temperature; five milligrams O. T. negative. Teeth, tonsils, sinuses, blood, Wassermann and Neisserian tests negative.

Case 70.—D. S., laborer, aged thirty-eight years. Recurrent active plastic iridocyclitis (and hemorrhagic retinitis and old choroiditis). Present attack incited nine days ago by trauma—eye struck by a small piece of iron. Inactive pulmonary tuberculosis. Voice sounds increased and piping rales heard posteriorly in the right chest at the apex of the lower lobe; temperature of 103° thirty hours after five milligrams

O. T., teeth, tonsils and sinuses negative. Wassermann and Neisserian tests negative. (History of an old gonorrhea.)

Case 71.—Nurse, aged thirty-eight years. Recurrent "serous" iridocyclitis with corneal lesions suggesting phlyctenular disease and old choroiditis. Inactive pulmonary tuberculosis. Occasional rale heard at right apex and a slight rise (99.4°) after three milligrams O. T. Twenty months later "daily rise in temperature to 99.4°, enlarged bronchial glands and evidences of inactive lesions at both apices." (Dr. H. H. Stark, El Paso.) Teeth, tonsils, sinuses and blood, Wassermann and Neisserian tests negative.

Case 81.—School girl, aged eighteen years. Chronic "serous" iridocyclitis, with old anterior choroiditis. Inactive pulmonary tuberculosis. Right apex breath and voice sounds decreased, bronchial breathing increased posteriorly down to midscapular region on the right side; X-rays show fan-like radiating shadows, more pronounced in the upper right lung, with increased shadows at each hilus; loss of thirteen to fifteen pounds in weight; a persistent daily rise in temperature of 5° to 1.5°. Three milligrams O. T. gave 99.8° at the sixteenth hour. Tonsils, teeth, sinuses and Wassermann and Neisserian tests negative.

Case 40.—Male, aged thirty years. Chronic recurrent plastic iridocyclitis, with old choroiditis. Repeated examination of the lungs showed no demonstrable disease. Well marked general and temperature reaction (101°) to three milligrams O. T. on the second day. Definite healing of the uveitis following tuberculin (B. E.) treatment. Teeth, tonsils, sinuses, Neisserian and Wassermann blood tests negative.

Case 52.—Locomotive fireman, aged twenty-nine years. Chronic nodular iridocyclitis, incited by strongly irritating medicine used in the eye by mistake. Repeated examination of the lungs showed no demonstrable disease. One-half milligram O. T. gave 100.8° at the forty-eighth hour and two milligrams gave 100° at the twenty-fourth hour. Teeth, tonsils, sinuses and Wassermann and Neisserian blood tests negative.

Discussion.—Dr. George F. Suker said it was a question whether or not one was able to demonstrate the presence of tubercle bacilli either in the iris itself, or whether one looked upon the iritis as being caused by the presence of the tubercle bacillus, or by a toxin elaborated by the presence of the tubercle bacillus elsewhere in the body, being practically a transferred infection. If this was the case, not only the local condition itself must be fully looked into, but the general condition of the patient needed more attention.

Dr. Brown stated that as to whether the iritis was of a toxic or bacterial nature, he did not think there was any particular consensus of opinion, and there was no particular evidence of any value to show whether the iris might not contain tubercle bacilli, but men working in the bacteriologic departments seemed to emphasize the presence of organisms or the toxins of organisms.

Dr. William H. Wilder asked whether traumatism to the eye in a tuberculous subject would have the tendency to cause a lesion that might ultimately become tuberculous.

Dr. Brown replied that three cases were of that type. The eight cases reported constituted a small percentage of one hundred cases. They got tubercular reactions in something like forty of the cases.

Dr. Willis O. Nance said that in the etiology of one hundred cases he had noticed in over one-third of them there were dental or tonsillar troubles, and about one-quarter were due to syphilis. He would like the essayist to say something further about this.

Dr. Brown said that in ninety-eight out of one hundred cases they had Wassermanns made, both at the Presbyterian and Cook County Hospitals, and where the reports conflicted they were done over again. They eventually got the men in the two laboratories to agree on the same technic. Of seventeen cases examined, nine of them had positive Wassermanns, and eight of them had positive gonococcal complement fixations. A lot of them had tuberculous infections; many of them had three to five infections.

Dr. Nance said he was interested in the dental and tonsillar aspect of these cases, and would like to know more about them.

Dr. Brown said the dental cases were based largely on alveolar abscesses, and not particularly upon pyorrhea. Some therapeutic observations were made in connection with the diagnostic points. Attention was given to the dental aspect of these cases by Dr. Potts.

In some cases the ciliary injection disappeared and a few days later returned with secondary glaucoma, and tension dropped very materially as the result of extracting teeth. The tonsillar cases were seen and attended to by Drs. Shambaugh, Friedberg and Sonnenschein.

Dr. Francis Lane recalled a very difficult case of tuberculous iridocyclitis following a nonperforating injury of the eye which he and Dr. Dodd reported to the American Medical Association in 1911. In this case a typical giant cell growth was found in the ciliary body, in which typical tubercle bacilli were found stained in the tissue. Five hundred sections were made of the anterior segment, from which thirty or forty showed typical miliary tuberculous areas.

Dr. Robert Blue asked Dr. Brown whether he had encountered any cases of rheumatic iritis, or whether these were included under the dental or some other heading.

Dr. Brown said that rheumatism was not considered a very illuminating or prolific cause of iritis. Rheumatic iritis was given a hard blow by de Schweinitz in 1911, and in all these cases there was some form of infection.

The Use of Eyes of Kittens in Ophthalmic Operative Teaching.

Dr. William A. Fisher stated that pig's and rabbit's eyes had been mentioned, and could be obtained readily in large quantities for teaching purposes, but the former did not offer much to the student, because as obtained commercially they were delivered enucleated, thus precluding practice upon the muscles; and since they had such a large and thick cornea, they were quite impractical for corneal work. The iris was so thick that operations upon it were likewise very unsatisfactory, but with all these objections the eye of the pig was universally used for teaching operations upon the eyeball.

For work upon the eyeball proper, the eyes of kittens were far superior for all purposes to all others mentioned, and when once used they would never be discarded. As in the case of other animals, the kittens should be killed before beginning work, after having been dusted lightly with powdered naphthalen to dispose of any vermin present. The killing might be most conveniently and cheaply done by the injection of one-half grain of strychnin sulphate intrapleurally.

Any student could with one hundred kittens do as much operative work as the busiest oculist in many years. One hundred kittens (two hundred eyes) would furnish material for four hundred muscle operations, two hundred enucleations, two hundred iridectomies, and two hundred cataract extractions, making in all one thousand operations. If the student used this or twice this amount of material, he could not fail to bring to his operating room an experience and confidence that could be secured in no other way.

The author drew the following conclusions: 1. Students could not become competent to do surgical operations upon the eye by watching others. 2. The eyes of kittens four weeks old were better for teaching ophthalmic operations than were those of other animals. 3. The material was not difficult to obtain. 4. Any student who had prepared himself for ophthalmology could get an operative technic in this manner that was not equaled by any other.

Detachment of the Retina.

Dr. Hughes reported a case of detachment of the retina. The patient was a man, forty years of age, whom he saw for the first time a week ago. When first seen, without dilatation of the pupil, one could see a grayish mass protruding through in the line of pigment, and with dilatation of the pupil one could observe the mass extending well out. With vision about the temporal side of the retina he could distinguish things fairly well. The speaker did not attempt to get distinct acuity of vision, but patient complained of limitation of vision.

The history was of no particular importance. Two weeks before this time patient had an accident which resulted in a foreign body penetrating the eye, he having been hit in the eye by a hot piece of iron flying from a drill. He had no subjective sensation referable to the eye, and complained of no loss of vision up to that time. His general health was fairly good. Patient is of medium size, and sallow in color. On examination of the eye, one can see where the detachment of the retina begins around the macula, extending nearly over to the disc and becoming elevated about seven diopters.

He would like to know from the members the true nature of the case.

Discussion.—Dr. William A. Fisher considered the case one of sarcoma of the choroid, and if it were his case he would explain to the man that he had a growth of some kind in his eye; that he would cocainize the eye and draw off the fluid, and if fluid could not be withdrawn, he would not hesitate to enucleate the eye.

Symblepharon.

Dr. John A. Pratt, Aurora, reported a case of complete symblepharon. The eye had been burned by hot metal and the doctor in charge had performed evisceration. The particular feature about the operation for symblepharon that was different from anything he had ever seen, was the making of a double row of holes in the large tin plate prothesis used, and the suturing of the Thiersch graft to the plate, which sutures were cut after six days. The entire graft seemed to have taken, but had contracted to one-third of its original size. His idea now is to build the superior and inferior fornices with the foreskin of a small child, instead of the use of Thiersch grafts.

He would like to know if any member had ever used foreskin in the place of a Thiersch graft, and if so, what the result had been.

He intended to do a Week's operation. While the eye seemed to be doing well, more operations are necessary.

Discussion.—Dr. Suker stated that foreskin, if used as a graft, acted very nicely when transplanted. There was this disadvantage, however, that it contracted much more than skin taken elsewhere. A graft of foreskin would take readily, but the end result was not quite as good as it might be.

Calcareous Deposits in the Cornea.

Dr. Harry S. Gradle reported the case of a man who came to see him a week ago with a history of having had repeated ulcerations of the cornea, evidently of neuropathic origin, for the past seven years. He had had twelve ulcerations during this time. The last attack occurred last September. The Wassermann reaction was negative; tuberculin reaction was negative.

An interesting feature is the calcareous deposits, particularly in the right eye. There is one deposit over the pupillary area, the result of the last attack in December and January. Patient had tried practically everything without avail. He had gone through routine procedures, such as massage and heat, without relief.

It was suggested by an internist that in hyperparathyroidism there is a deficiency of calcium in circulating plasma. The patient has been fed large quantities of parathyroid extract, trying to produce a deficiency of calcium which will lead to some absorption of the calcium in the cornea. If this is of no avail, the only thing is to resort to some form of operation.

Regular meeting, held November 20, 1916. Dr. William E. Gamble, the president, in the chair.

Tower Skull With Double Optic Nerve Atrophy.

Dr. Michael Goldenburg read a paper on this subject, and stated that anomalies in the development of the skull are very common and have been thoroughly studied by workers in this particular branch of pathology.

The tower skull, or "thurmschadel," as the Germans call it, is of special interest to us as ophthalmologists, owing to the frequent pathologic eye findings associated with this condition. Not that the eye findings are only found in this particularly shaped head, or that ocular lesions are always found here, but they come to us as ophthalmologists for the eye affection, and we find this probably the most common deformity of the head. Again, it is quite probable that malformations of the head are more commonly the cause of eye lesions than one is led to believe from the available literature. We find, for example, that up to 1912 only twenty-six cases of tower head had been reported. Enslin, who was looking for these cases over a period of two years, out of 9,380 eye patients found sixteen cases of this kind; so that it is quite apparent that if we do not look for a special condition we do not find it, unless it is an extremely marked case, as in the one we present.

Tower skull per se as the cause of eye disease is still problematic, for we find a number of cases reported of this shaped head without any eye lesion at the time of examination; of course, it is quite possible that a transitory eye lesion might have been present and left no evidence later in life when examination was made.

One could reason that this definite skull malformation must have some influence, for we find that in all the cases reported we have virtually one eye lesion, and that an affection of the optic nerve. In the forty-two cases reported, thirty-six had a postneuritic atrophy, two with a double neuroretinitis, two with one-sided papillitis and postneuritic atrophy, and two cases with primary optic atrophy.

The question that arises is whether tower skull is the direct or indirect cause of the optic nerve lesion. The theory propounded that the causal factor responsible for the malformation of the skull is also the cause of the optic nerve lesion has a number of adherents.

We find that maldevelopments of the skull are due to a premature ossification of the different sutures, and in this particular form the coronal suture is closed very early, with compensatory development or maldevelopment taking place vertically to the closed suture.

The probable cause of the premature ossification of this suture, the time of onset, whether intra- or extrauterine, is very interesting, and much can be said; but we shall only state at this time those essentials that might be associated with the eye lesion.

In a number of cases reported and in the one we are presenting we are inclined to believe that this process began during the prenatal period.

That an osteitis is present and is the probable cause of the premature ossification of the sutures, nearly every one is agreed upon. The etiology of osteitis, at least in adult life, is infection of some character. That a metastatic infection during intrauterine life is possible there is no doubt, and is not strange to ophthalmology.

The theory of excessive nutrition of the bones, possibly brought about by a passive hyperemia, as propounded by Bier and referred to by obstetricians, under the caption of abnormal positions or flexions of the fetus, must also be given some consideration.

Michel states that he is inclined to think that the change in the growth of bone is due to an increased process of nutrition.

The history in our case plus the X-ray plates will, we believe, throw some light on this obscure subject.

The family history, as far as we could ascertain, is apparently negative on both sides of the family tree. The mother of our patient has two additional children living, and as far as one can see they are perfectly normal; the photograph shows an older sister. One child died of a valvular lesion.

The mother states that all her labors were normal, but that she had some difficulty with our subject, the attending physician having found the head rather long, but succeeded in delivering her without the use of instruments.

When the child was born it had too many soft spots on the top of the head, particularly in the center, where the mother says there was noted a marked thumping. The front part of the head was hard. Both the veins and arteries over the temples were very prominent, and a marked pulsation was present, particularly so upon the left side. There seemed to be a large hard protrusion somewhat above and back of the left ear.

Physicians who saw the case at that time thought the child had been delivered by instruments. The child had great difficulty in nursing and breathing at the same time, and even when not nursing, breathing sounded as if she were choking. The attending physician was inclined to think there was a growth in the nose, but nothing was done in this direction. The attending physician's opinion in regard to her head at this time was that she had water on the brain.

As regards the eyes, they were very prominent and the child did not seem to show evidence of being able to see very much as far as the mother can remember. The child had no lesions of any kind on the skin, and was apparently otherwise normal. When four months of age she developed a rash on the left cheek and later also on the right cheek, but this rash soon disappeared.

At the present time we have the tower skull with a bitemporal circumference of seventeen and three-fourths inches. A sagittal measurement of fourteen and three-fourths inches from nasion to occipital protuberance. Perpendicular from nasion to highest point of the skull of five and one-half inches, and an anterior posterior diameter of five and one-half inches.

The eyes are very prominent, but it is questionable whether this condition can be called a true exophthalmus. The eyeballs are very large and the sclera thin. The cornea normal in size, transparency and sheen. We have a divergent strabismus with a marked horizontal nystagmus.

Anterior chamber and iris negative. The pupillary opening is about six millimeters, and equal in both eyes, and reacts very sluggishly to bright light. Tension negative. Vision in the right eye nil. Retinoscopy of — 5.00 in both meridians, with no improvement in vision. Left eye 4/200 — 6.50 — 3.50 ax. 150° = 8/200.

Fundus: Discs are dirty gray, and outlines not well defined; could not be sure as to the caliber of the vessels, owing to the marked nystagmus, but we are inclined to think that there is some evidence of a perivasculitis. Direct ophthalmoscopy was very difficult and unsatisfactory.

Nose: Vestibule of septum negative, as if it had been pressed down upon, and lies spread over the floor of the inferior meatus; pronounced deviation high up.

Note the wrinkling of the skin around the mouth, with no evidence of scars; similar wrinkling of skin, but very much more marked and almost black, as if dirt had been ground into it, is noted over the abdomen, axillæ and on legs, which was pronounced by a dermatologist as an ichthyosis with an abnormal distribution.

The teeth are in bad condition, and the alveolar process of the superior maxilla is very thick; the hard palate is very high, and the greatest distance between the base of arch is five-sixteenths of an inch. The soft palate is very long, but otherwise negative. Inferior maxilla negative.

Ears: Externally negative; drums show absence of sheen and are slightly retracted. Hearing very acute both for low and high tones; a rather remarkable feature is that the bone conduction is as great, and sometimes greater, than the air conduction.

General health good; her only complaint is that of a little pain over eyebrows, especially in cold weather.

Mentally, when one takes into consideration the vision and lack of education, we can say she is quite bright. Plays the piano by ear.

Our roentgenographs show the skull to be very irregular in thickness, with numerous depressions on the inner table, undoubtedly formed by the convolutions of the brain. Suture lines were not demonstrable, and the grooves of the meningeal vessels or diploic veins were markedly accentuated. The sella turcica was approximately normal in size. No evidence of pathology responsible for the exophthalmus. The roentgenographer further states there is premature ossification of the sutures, leading to a condition known as internal hydrocephalus, and the increased intracranial pressure is responsible for the peculiar markings on the inner table.

Owing to the peculiar facies, we were inclined to think of congenital lues, but this had to be excluded by the family history, clinical and serologic findings. Urinalysis negative. Tubercular tests were not made.

It seems to us that this case is well worthy of presentation for several reasons.

The apparent evidence of the disease during the prenatal period. The fact that seventy-five per cent of these cases are seen in the male, and by far the largest percentage of total or partial blindness occurs in the male. Most of the cases are not recognized until long after birth, when the patient usually comes in for some other condition, or his or her failure to pass some eye examination, when a postneuritic atrophy or a primary atrophy is found and the thought suggests itself to us, that possibly some of the socalled amaurotic eyes could be explained upon these grounds.

According to von Graefe, the atrophy following a neuritis can for a long time be recognized as such, but not forever, as later it cannot be differentiated from a primary atrophy.

The fields are, as a rule, the same as in papillitis—i. e., concentric contraction. Where vision was good there was found no enlargement of the blind spot.

Dr. E. K. Findlay reported a case similar to that narrated by Dr. Goldenburg.

Area Centralis in Birds.

Dr. Casey A. Wood presented the above subject. His remarks were illustrated by numerous slides.

A New Form of Keratitis or Inflammatory Degeneration of the Cornea.

Dr. Robert von der Heydt gave a translation of part of a lecture by O. Haab, of Zurich, under the above caption. A continuation of the translation will be presented at the next meeting.

The Spontaneous Explosion of Snellen Improved Artificial Eyes.

Dr. Alexander S. Rochester stated that the phenomenon of the spontaneous explosion of Snellen improved artificial eyes was definitely brought to his attention a few months ago by a report from one of Dr. Casey Wood's patients, which told of having had two different eyes explode within a short space of time, each accident happening while the eye was being worn in the proper manner. Thinking it might prove interesting and, at the same time, develop some facts of value, a short notice was inserted in the *Ophthalmic Record,* requesting a report on any cases of this kind that might have come under the observation of the readers. In response to this request, the author received twelve replies from different physicians, telling of eighteen occurrences of this nature that have happened in their practices.

As to the particulars regarding the circumstances at the time of the explosions, all the cases presented histories of a more or less similar type. The story as told by the patient is generally on the order of the following: He will state that while engaged in some normal occupation or pastime, he suddenly heard a report as if a pistol were shot off in close proximity to his head; at the same time he felt a sharp pain in the affected orbit, and on placing his hand to the part found the eyelids covered with blood. Quite naturally he generally tells that he was greatly frightened and immediately consulted his oculist.

The replies from the physicians to whom this series of cases would apply show that none of the orbits sustained serious damage. In eighty-eight per cent of the cases there was some abrasion of the orbital lining membranes, varying from a slight cut which healed in several days, to deep lacerations which required two weeks in healing. From one to ten pieces of broken glass were found, in most of the cases, imbedded in the soft tissues and had to be extracted by the attending doctor. Two of the patients lost consciousness, but this was in each case due entirely to fright, and occurred in individauls of a hypersensitive nature.

Quite a number of the patients state that their first impression at the time of the accident was that they had been shot in the eye, and even some of the bystanders hearing the report and seeing blood running from the orbit, for the moment held the same opinion. Each explosion reported was absolutely spontaneous, there being no cause to which the individual could attribute it.

The receipt of this series of reports has shown that the spontaneous rupture of the Snellen improved eye, while being worn in the orbit, is not a remarkably rare accident. In fact, the author has found through interviewing one of the large manufacturers of artificial eyes, that during the course of a year they will probably lose twenty-five eyes by spontaneous explosion, this occurring while the eyes are stored on shelves and from a stock numbering twenty-five thousand. This means that one-tenth of one per cent of the improved eyes manufactured may be expected to explode, even though they may be lying quietly packed away and not subjected to the many vicissitudes encountered by the eyes while in use.

In attempting to find the cause of these explosions, the method of manufacture was first studied and the manufacturers themselves interrogated. The makers state that in producing the Snellen improved type it is absolutely necessary to seal the back of the eye while the whole ball is at a white heat. This naturally results in a partial vacuum of rather high degree in the interior of the globe after cooling has taken place. There is, therefore, a continuous pressure being exerted on the outside of the finished eye. If there be a sudden change in the temperature of the globe, or a decided inequality in the temperature of different parts of the globe, the resulting sudden or unequal expansion or contraction renders the glass less strong and, therefore, less able to withstand the continuous atmospheric pressure.

It has been found that most of the explosions have happened either during very hot or very cold weather. In this series of cases at least one-half are said to have happened on exceptionally hot days.

The fact that the globe is built up of many different colors and grades of glass, and that the walls are in the finished state of many different thicknesses, makes the proper annealing of the whole a very difficult problem. This one problem of completely and successfully annealing the eye so that it will be absolutely impervious to all changes and conditions of temperature, is something that has not yet been accomplished by the makers. They state that a great deal of study has been put on the subject during the past years, and one large manufacturer states that as soon as the present rush of business, brought about by the great demand from the European battlefields, is past, they will again take up the problem.

The other deficiency of these eyes, and one which influences the possibility of explosion, is their susceptibility to the destructive effects of orbital discharges of certain patients. It has been found that certain individuals can wear an eye no longer than six months before discoloration and corrosion are seen to have begun. Others can wear the same kind of an eye for two years before any signs of deterioration are seen. The effect of the influence of certain persons' secretions on the glass is shown in this series of cases. Out of eighteen explosions reported, four patients had experienced the accident two distinct times. In other words, out of all the cases reported to have had the improved eye explode while in the orbit, twenty-eight per cent had had a repetition of the phenomenon. When we consider the very small percentage of those wearing artificial eyes who have them explode in their sockets, and then realize that twenty-eight per cent of these who have had the accident occur, have had it occur twice, the conclusion drawn must be that the individual socket exerts a deleterious influence on the glass; the only plausible explanation of this being that it is brought about through the chemical action of the secretions on the globe.

Discussion.—Dr. Robert von der Heydt related the case of a patient who wore a Snellen eye, but the eye did not explode. In this case, where the socket presented, there was an intractable conjunctivitis which did not respond to any treatment. Presumably the eye may have had a crack in it. The eye was not old. It looked smooth on careful inspection. He held the eye in his hand, and in so doing must have exerted a little pressure, when it came apart and emitted an odor which proved that the eye was filled with some liquid and had probably been cracked for a long time. He thought this case explained some of the forms of conjunctivitis met with in artificial eyes that would not respond to any treatment.

Dr. John A. Pratt, Aurora, said that about six months ago a man came to his office wearing a Snellen eye, and stating that he felt something had happened to it. The patient tried to take it out of the socket, but could not do it. By means of pressure the doctor took it out and found a hole in it about one-third the diameter of the eye, and on account of the vacuum the eye was sucked right in and could not be drawn out by the patient.

Dr. Michael Goldenburg recalled a case in which an artificial eye broke in the orbit, but the occupation of this patient was such as to necessitate his traveling from a warm room into a cold one, like an ice chest, which might have had something to do with the explosion.

Dr. Rochester, in closing, said the point about the vacuum drawing discharges into the eye was brought to his attention by a maker of these artificial eyes, who stated that one thing producing the symptoms, frequently being the cause for continued irritation, was that a small crack has occurred in the eye and the eye becomes the seat of an irritating, foul smelling material which keeps up constant irritation.

Dr. C. F. Burkhardt, Effingham, stated that while he had not had trouble with artificial eyes exploding, he recalled two instances which occurred in his office which might have proved more serious than the explosion of an artificial eye. In using glass electrodes he had two of them explode. He was using them at the time in connection with patients, and the accident might have proved dangerous because by the explosion glass was scattered over his operating room. One of the glass electrodes was in a glass case at the time of the explosion. The glass electrode was made similar to the artificial eye, and he presumed the explosion was due to the vacuum.

PAUL GUILFORD,
Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of October 21, 1916. Dr. E. M. Marbourg presiding.

Proptosis Due to Sinus Disease.

Dr. B. A. Filmer presented Mr. M., aged forty-nine years, first seen April 12, 1916. Right proptosis past four weeks. More or less conjunctivitis, asthenopia and edema. Pupil slightly smaller than the left and regularly dilates two-thirds under homatropin. Several X-ray pictures, all negative. Takes cold easily. Nasal septum deflected to the right. July 7th, corneal ulcer at junction of middle and lower third. Had submucous resection, as the deflected septum was pressing heavily against the middle turbinate. The anterior and posterior ethmoidal cells and sphenoidal sinus were opened. His physician obtained negative results from the use of thyroid extract and potassium iodid.

Vision right eye, 20/120 + 1; left eye, 20/40 + 1. With correction, right eye, — 0.50 ○ + 1.25 cyl. ax. 75° = 20/50. Left eye, + 0.25 ○ + 0.75 cyl. ax. 120° = 20/20. A + 2.00 sphere was added for the near point. He had exophoria one and a half degrees and left hyperphoria two degrees. The fundus veins were full and tortuous in each eye, the right cornea hazy. October 21st, vision right eye, 20/80 — 1; with correction 20/40 — 2.

Discussion.—Dr. William C. Bane thought the fundi were negative by the indirect method, but said the conjunctival vessels were unusually large.

Dr. E. R. Neeper said this case had been presented by his associate, Dr. Filmer and himself, because of the unusual symptoms and doubtful etiology. The inflammation in the eyes was much less, immediately after the nasal operation.

Dr. J. A. Patterson thinks the X-ray was misleading, as the posterior ethmoidal cells were formerly involved. He saw the case a few months ago, and thought there was exophthalmus of each eye, that of the right being more pronounced. The nerve heads were negative, but there was limited movement of the eyeballs.

Dr. W. A. Sedwick believed the accessory sinus disease was the cause of the eye change.

Embolus of Central Artery.

Dr. Neeper presented Miss W., aged seventeen years. Right eye suddenly became blind while combing her hair at 7:40 a. m., September 13, 1916, and has remained so. Circulatory changes were apparent when first seen, three hours later. Macular changes have developed in the meanwhile. She was examined by Dr. W. L. Bortree, and the following is his report:

Family History: Father, mother, two sisters and two brothers living and well. Mother had two miscarriages following birth of patient. Cause unknown. Two younger children well.

Past History: Scarlet fever when four years old, a light case; physician not called, and no sequelæ. Measles when six, whooping cough and mumps when eight. All light cases and no complications or sequelæ.

Physical Examination: Well developed and well nourished girl. Skin and mucous membranes of good color; teeth in good condition. No cavities, no pyorrhea. Throat clear, tonsils small and buried. Nose negative. Right lobe of thyroid slightly enlarged. No thrill, pulsation or bruit. No tracheal tug.

Lungs: No dullness, rales or altered breathing. Expansion equal and good.

Heart: Slight enlargement to the left; apex impulse very strong in fifth interspace to left of nipple line. Heart sounds clear, no murmur. Second sounds at base louder than normal, sharp in character; aortic louder than pulmonic.

Abdomen negative. Reflexes negative.

Blood pressure: Systolic, 140; diastolic, 92; pulse pressure 58. The internist does not know the cause of high arterial tension.

Menstruation regular, scanty, not painful; began when thirteen years old.

Habits: One cup of tea and two of weak coffee daily. Little sweets. Sleeps seven to eight and one-half hours per day. Bowels regular. Sleep, appetite and digestion good. No cough, pain or dyspnea. Present weight, one hundred and eight pounds, the maximum.

Urine: Twenty-four hour quantity, one and one-half pints. Clear, amber, acid, no sediment. Specific gravity 1024. Total solids, 42 grams. Urates increased. No albumin, sugar, acetone or diacetic acid. Indican moderately increased. Sediment shows many calcium oxalate crystals and squamous cells. No casts, blood or pus.

Blood: Hemoglobin, 98 per cent Dare. Red cells, 4,216,000; white cells, 5,800. Red cells normal in size, shape and color. No parasites. Blood platelets negative. Polynuclears, 72 per cent; lymphocytes, 11 per cent; small mononuclears, 13 per cent; large mononuclears, 2 per cent; eosinophiles, 2 per cent.

Discussion.—Dr. A. C. Magruder had a similar case in an older woman. He saw Dr. Neeper's case about six hours after the embolism. He gave massage, large doses of salts, etc., all without benefit, so that the prognosis was serious. Dr. Neeper used amyl nitrate.

Dr. Otis Orendorff asked if this disease usually occurs in women. He had a case in a ranchman's wife with a cilioretinal vessel, which gave for a time a better prognosis. She could only see shadows in field of the cilioretinal vessel. He used dionin subconjunctivally, but without permanent improvement.

Dr. Neeper asked how many had seen this disease in young adults or childhood. Dr. Marbourg had, but Dr. Jackson had not. Dr. Jackson thought this patient might have a thrombus, not an embolus.

Dr. F. E. Wallace asked if pulmonary tuberculosis might be a cause.

Dr. F. R. Spencer said the prognosis is good for the left eye, as the bilateral involvement is unusual.

Dr. Jackson stated that there are very few bilateral cases in the literature. He referred to Harbridge's case of spasm, in which salts were used to give relief. He thought Dr. Neeper's case was one of spasm at first and thrombus later.

Dr. William H. Crisp stated that it is the general experience that blood does not clot readily in any part of the eye, so why should it clot so quickly in the central vessels. He also believed that the vessel was at first rough and the clot formed later.

Spasm of Retinal Vessels.

Dr. Neeper reported another case, in which spasms of the vessels had been present for three years with complete blindness in the upper field for an hour at a time. The attacks are now occurring oftener. There are three impacted third molars, so he wonders if the impaction produces spasms of the retinal vessels reflexly. He is studying this case and X-rays have been taken. He may advise extraction of the impacted teeth.

Discussion.—Dr. Crisp asked if it were a scintillating scotoma, which he thought might explain the case.

Dr. Neeper replied in the negative.

Dr. Jackson related a case of impacted third molar with migraine; change in refraction and scintillating scotoma. Patient free from attacks now at the age of twenty-four years.

Stellate Cataracts.

Miss G., twenty-one years old, was first seen August 8, 1916. Six years ago, while in school, after an eye examination, the school nurse advised others to get glasses, but said nothing to her about getting them. In the past six months vision has become so poor she no longer enjoys the movies. Vision right eye, 20/200; left eye, 20/200 + 1, not improved by lenses. She had unusual stellate cataracts with rather broad opaque striæ and vision so poor that needling may be required later.

Mr. C., aged twenty-one years, healthy. Vision always poor. Right eye, 20/60 + 3; with a — 2.25 ⊂ + 3.50 cyl. ax. 110° = 20/30 — 2. Left eye, 20/80 — 1; with a — 2.25 + 4.50 cyl. ax. 90° = 20/50 +. This was a second case of unusual stellate cataracts, and will not require operative interference soon, for he had reasonably good vision with his correcting lenses.

Neuroretinitis Due to Sinus Disease.

Dr. E. E. McKeon presented H. W., aged twenty-four years. General health fine. Three years ago had iritis which lasted several weeks. After this, lenses were ordered which gave him 20/20 vision in each eye. About six months ago he drove through a blinding snow storm for two hours; following this there was quite marked irritation of the lids. Two weeks ago vision suddenly failed to light perception. Dr. Jackson, of Salida, treated him with mercury and iodid. The Wassermann reaction and urine examination were negative. It was impossible to take the fields of vision. Examination first showed a hazy vitreous, but this seems to have cleared somewhat. The vessels were tortuous, especially in the superior part of the retina. The disc was not clearly outlined.

Discussion.—Dr. William C. Bane found interference with return circulation and a hemorrhage below. The disc was hazy and the vessels tortuous. There was also a hemorrhage of the macula.

Dr. Jackson suggested venous thrombosis, possibly from accessory sinus disease. He also suggested that the exophthalmus be measured.

Dr. Spencer suggested retinal tuberculosis, but said he believed the accessory sinus disease more probable.

Interstitial Keratitis Due to Acquired Syphilis.

Dr. J. A. Patterson presented Mrs. M., widow, aged twenty years, employed at a laundry. On October 14th there was a sensation of a foreign body in her left eye, and when first seen, October 18th, there was a marked point of congestion at the limbus up and in, with interstitial haze running from this point toward the center of the cornea; aqueous slightly turbid. Pupil dilated widely, except below, under atropin. There was no synechiæ. Hot stupes aggravated the condition. She suffered a relapse October 20th, with pain; the iris was inclined to adhere below, but the pupil dilated readily. The upper and lower first molars were decayed. The first upper left molar showed evidence of Rigg's disease.

Dr. Patterson wanted the opinion of the society regarding the etiology of the case; he believed it luetic. He has used aspirin, salts, gray powder, etc. He wanted to have a Wassermann made, but the patient could not afford it.

Discussion.—Dr. Thompson suggested a return to potassium iodid and mercury.

Dr. Jackson thought it might be due to tuberculosis.

Dr. Orendorff pushed sodium salicylate in a similar case of mild rheumatism, and the patient responded well to treatment.

Dr. Neeper thought these cases hard to classify, but that they usually get well after a long time. He gives a mixed treatment.

Dr. Spencer suggested that the luetin and von Pirquet tests be given, as poor patients often cannot afford a Wassermann.

· Dr. Magruder compared Dr. Patterson's first case to that of a girl with keratitis of a moon shape, which he reported before this society at the January, 1916, meeting. In this case Descemet's membrane was steamy.

Dr. H. R. Stilwill thinks the patient would give a positive Wassermann.

Glaucoma.

Dr. Patterson also presented Mr. B., a negro, aged forty-seven years, who came complaining of presbyopia. Admitted left eye had been blind for some years, having gradually become so without pain. Had never consulted an oculist. Vision right eye, 8/5; left eye, blind.

Ophthalmoscopic examination of right eye showed a peculiar coil of large veins at the nasal edge of the disc. The nerve looks atrophic. He had a full candle field. Left eye showed typical glaucomatous excavation to periphery. Tension right eye 60, and left eye 45. Under pilocarpin, right eye 40 and left eye 45.

Discussion.—Dr. Jackson thought the most interesting feature of this case the coil of vessels anterior to the disc and projecting forward from it. This looked something like a nevus.

Dr. Crisp expressed the same opinion.

Tuberculous Ulcer of Conjunctiva.*

Dr. Patterson reported a case of tuberculosis of the conjunctiva. The patient being bedridden, he was unable to present her, but showed a beautiful water color painted by Miss Leaming.

Mrs. F., aged fifty-seven years, was seen on July 29, 1916. She came here for pulmonary tuberculosis, but did not consult a physician until after she had spent five days walking around and was compelled to go to bed. The patient gave a history of having had tuberculosis two years; had a relapse in June, 1914, induced by an attack of influenza. On August 5, 1915, she became an inmate of the State Sanitarium for Tuberculosis of

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*See page 76.

Iowa. She returned to her home in Iowa, February 5, 1916, where she endeavored to continue out-of-door treatment.

Dr. W. H. Swan, through whose courtesy he saw the case, found the patient dropsical, which had been noticed for seven weeks. The urine showed albumin and blood casts; a rather extensive tuberculous infiltration in the left lung and the right lung involved to a less degree. The patient has had marked elevation of temperature for many weeks.

Upon everting the lid of the right eye there was a large round ulcer three millimeters from the edge, and another, of linear shape, below and slightly outward from the first, located exactly upon the fold of the everted lid. The round ulcer had deep undermined edges, the center being gray and somewhat speckled. The center was depressed, giving a slightly umbilicated appearance. The linear shaped ulcer was narrow, with equally steep undermined edges, the center being the same gray color. A small quantity of mucopus was daily secreted and would accumulate at the inner canthus, as shown in the picture. The patient removed this with her handkerchief many times during the day. The bulbar conjunctiva has shown barely any congestion, nor has there been much congestion surrounding the ulcers. No involvement of the lymphatic glands could be found in the facial or cervical regions. The larynx was free from tuberculous invasion, but there was some catarrhal condition in both the larynx and trachea.

The patient first noticed that the eye was uncomfortable last March. The two ulcers were noticed by her medical attendant before she came here. A collyria of boracic acid has been the only treatment prescribed.

On August 3rd both of the ulcers were thoroughly curetted and cauterized with a saturated solution of trichloracetic acid. This was done very cautiously, but deeply. A strong solution of bicarbonate of sodium was immediately used around the ulcer, so that no excess could do damage to the normal tissue. The result has been an absolute cure, though the scars of the original ulcers can still be distinctly seen. The mucopurulent secretion, which was present, immediately ceased.

Discussion.—Dr. W. F. Matson spoke of a case similar to a stye, but with the abscess on the sclera. The patient was from the National Jewish Hospital in Denver. He curetted this almost to the choroid. Tuberculous meningitis developed, followed by death.

Dr. Jackson thought Dr. Patterson's case one of undoubted tuberculosis of the lid. He referred to a case with negative von Pirquet, etc., who developed tuberculous meningitis. The patient was operated upon in Arizona for a tumor and recovered. He is now living in Arizona. The sclera was first involved in each eye similar to Dr. Matson's case.

Eye Injured by Scissors.

Dr. A. C. Magruder presented a pathologic specimen of an eye which was injured by a scissors cut at four years of age, and enucleated at the age of eighteen, because of pain and lowered vision in the right eye.

Discussion.—Dr. Jackson suggested that this be sectioned by Dr. Wm. C. Finnoff.

Eye Injury Causing Blindness.

Dr. Magruder reported a case of a boy who had been struck in the eye by a harness buckle. The eye had been blind for years. Patient has been in the Kansas City clinics. Hyphema was present. The eye was cocainized and the anterior chamber opened and irrigated to remove the blood. Aqueous and blood came out through the irrigating wound. The pupil could be seen a few days later.

Luetic Ocular Paralysis.

Dr. Magruder reported a case of a man struck on the left mastoid. Blood came from the ear and the patient had diplopia. The railroad surgeon thought of a basal fracture. He was first examined by Dr. Magruder two months after the injury. An X-ray eliminated a basal fracture. The membrana tympani had been ruptured, as was evidenced by a scar. Patient had high esophoria. Patellar reflexes were absent. The blood Wassermann was negative. The patient refused a spinal fluid Wassermann. Patient had vertigo, and one eye had to be covered to avoid vertigo and diplopia. Lues was suspected. Patient was given potassium iodid and mercury. He showed great improvement and was able to work after a few weeks of vigorous treatment.

Dr. E. M. Marbourg presented the following cases:

Cryptophthalmos.

A girl from the blind school with cryptophthalmos. The mother and one brother have the same condition. This child has been operated upon twice. She has good light perception.

Microphthalmos.

A case of microphthalmos with posterior polar cataracts and nystagmus.

Pseudoglioma.

A deafmute with cataracts since two years of age, following an attack of cerebrospinal meningitis. The left eye is negative.

Discussion.—Dr. Jackson thinks this patient had pseudoglioma, vitreous opacities, retinal detachment and degeneration of the eye

Sarcoma of the Choroid.

A case of retinal detachment, best seen with a + 12.00 D. lens. Dr. Jackson stated there was pigmentation in an arc up and forward. The choroidal vessels were very evident. They looked like a flat sarcoma, but there may have been some other process in the choroid. Transillumination is very difficult, as this is too far back for transillumination. The sarcoma may be pushing the retina forward. This case is one of unusual detachment and should be watched.

Discussion.—Dr. Wm. C. Bane thought the retinal detachment not gray enough and too smooth for a serous detachment. He thinks this is suggestive of a sarcoma.

Exophthalmometer.

Dr. F. R. Spencer presented a Bausch and Lomb exophthalmometer for inspection. This is a modification of Prof. Hertel's original model. With this instrument the exophthalmos can be easily measured.

Meeting of November 16, 1916. Dr. D. H. Coover, presiding.

Divergent Squint.

Dr. E. Jackson presented a young man, aged twenty-one years, who had a divergence of thirty-five centrads in December, 1914. This had gradually increased up to this point during the four or five years prior to the above date. A tenotomy of the right external rectus, combined with advancement of the right internal rectus, left twenty-five to thirty centrads of divergence. Dr. Jackson then performed an extended tenotomy on the left external rectus, holding the eye in for thirty hours. At the present time (two years after operation) he has only four degrees of exophoria.

Discussion.—The members of the society commented upon the small cicatrices and the good result.

Convergent Squint.

Dr. Wm. C. Bane presented a young lady, aged twenty-one years, whom he first examined October 25, 1916. She gave a history of convergence of right eye since four years of age. When six years old she began wearing glasses, and continued to wear them for eighteen months. Three years ago she began to wear lenses again. The vision with her glasses was: Right eye 5/20, and left eye 5/4.

Examination showed the convergence to be sixty centrads, equaling seven millimeters.

On October 31, 1916, he performed Dr. Melville Black's advancement operation. The internal rectus was severed and the external rectus severed and advanced.

November 10, 1916, she was refracted and given the following lenses: Right eye, + 1.50 ○ + 0.50 cyl. ax. 75° = 5/10—: left eye, + 1.50 ○ + 0.37 cyl. ax. 5° = 5/4.

The result of the operation was very satisfactory.

Discussion.—At the request of Dr. J. A. Patterson, Dr. Wm. C. Bane explained Black's operation in detail.

Dr. E. Jackson said Dr. Black's operation anchors the advanced muscle to the sclera with one suture, and that the operation was described years ago in the *Archives of Ophthalmology*.

Nystagmus.

Dr. E. T. Boyd presented a patient who formerly had a paresis of the superior rectus muscle of one eye and now has a rotary nystagmus of both eyes, with the quick component directed to the left.

Congenital Band in Vitreous.

Dr. E. T. Boyd also presented a girl with a fibrous band extending down and in from the disc of the right eye and slightly anterior to the retina.

Discussion.—Dr. D. H. Coover thought this band was a congenital defect, although he said it made him think of opaque nerve fibers when he first examined it.

Drs. W. H. Crisp, D. A. Strickler and F. R. Spencer spoke of the similarity of this structure as compared with proliferating retinitis. Dr. Strickler called attention to the fact that one of the retinal vessels was lost in the mass. Dr. Spencer said it had some resemblance to the fibrous mass left as a remains of the hyaloid artery.

Dr. E. Jackson believed this was undoubtedly a congenital structure or defect.

Dr. W. H. Crisp briefly reported a case, somewhat similar to Dr. E. T. Boyd's, in which there was a large colobomatous area in the macular region of the right eye near the disc. This area was oval, and a band of fibrous tissue extended from the disc to the coloboma.

Xerosis of Conjunctiva.

Dr. H. R. Stilwill presented a man, aged sixty-one years, with a history of "granulated lids" for the past twenty years. Two years ago he had an operation on the right upper lid for "ingrowing" cilia. The lid margin was split and a piece of mucous membrane from the lip was transplanted in the line of incision. The lids of each eye show old trachomatous cicatrices. The left cornea is negative, but the cornea and bulbar conjunctiva of the right have been dry for the past two years and show marked xerosis. This has been relieved by instillations of pure castor oil.

Discussion.—Dr. W. H. Crisp said the dryness was due to cicatricial contraction of the ducts from the lacrimal gland.

Dr. G. L. Strader asked if the lid operation could in any way have caused the xerosis.

Dr. Crisp answered this in the negative.

Dr. D. H. Coover suggested the removal of the conjunctiva and tarsal plate from the upper and lower lid, so as to let the fibers of the orbicularis come in contact with the eyeball. He said this would be much better than the cicatricial conjunctiva and distorted tarsal plates.

Dr. Stilwill, in closing the discussion, said he agreed with Dr. Crisp concerning the cicatricial closure of the lacrimal ducts, and he quoted from Parsons and de Schweinitz. He said he asked his patient not to instill castor oil the day of the meeting, so the members of the society could see how dry the cornea can be. The eye has some vision in spite of the ground glass appearance of the cornea.

Dr. D. G. Monaghan presented three cases as follows:

Traumatic Cataract.

D. McC., aged five years. History of forceps delivery with a contusion over the left eye. This eye was bloodshot for three months and has squinted. The lens of the left eye is cataractous and that of the right cloudy. The patient is wearing a + 2.50 sph. before each eye.

Corneal Ulcers.

Mr. W. T., aged thirty-six years; a health seeker because of pulmonary tuberculosis. In January, 1915, ulcers developed on the right cornea and resisted treatment for ten weeks. In October of the same year he had a number of ulcers on the right cornea. In April, 1916, a single ulcer developed on the left cornea, followed in a short time by many others until nearly the entire cornea was involved. All of the ulcers in each eye have been superficial and near the limbus, but some have been rather large. At the present time the central portion of the cornea is clear and the cicatrices of moderate density.

All but ten of his teeth have been extracted and his refractive error corrected. There is no specific history and no clinical evidence of lues. The nose and throat are negative, and the teeth have been examined by the X-ray.

Discussion.—Dr. J. A. Patterson suggested drawing the conjunctiva over the ulcers in case new ones form.

Dr. W. H. Crisp thought radiant heat should be applied.

Dr. Wm. C. Bane suggested Pasteurization by Prince's method, and he thought silver nitrate should not have been used. (Dr. Monaghan had used one per cent silver nitrate for several weeks during one attack.)

Dr. C. E. Walker said he would curette these with a spud, apply bichlorid of mercury 1/1000, and wash out the eye with water. He has found the healing prompt after this method. If the ulcers recur, the treatment can be repeated.

Dr. O. Orendorff thought this patient had suffered from a desquamation of the cornea rather than true ulcers, and he would use subconjunctival injections of cyanid of mercury. He would not use Pasteurization, as he believes this is more suitable for serpent ulcers.

Dr. F. R. Spencer said his personal experience with Pasteurization had been unsatisfactory, and he has used it in several cases. He stated he had seen Verhoeff, of Boston, use it in a number of cases without satisfactory improvement.

Traumatic Rupture of Iris and Choroid.

C. C., male, sixteen years old, was struck November 9, 1916, over the right eye with a piece of board from a saw at the manual training school. He was examined four days after the injury, at which time the eye was sensitive to light; there was circumcorneal injection, the pupil dilated and irregular. The sphincter of the iris was ruptured; there was iridodialysis at the lower nasal periphery, and a rupture of the choroid near the macula with hemorrhages and pigment. Vision was reduced to counting of fingers at three feet.

Discussion.—Dr. E. T. Boyd thought that the pigment in the fundus had nothing to do with the injury, as it was probably there before. The patient did not give a history of poor vision prior to the injury, however, and the urine was negative.

Dr. C. E. Walker related a case similar to Dr. G. C. Monaghan's. The patient, aged twenty years, was struck with a board and the lower lid cut so that two or three sutures had to be taken. The pupil was dilated and the lens cut and dislocated. Both the retina and choroid were ruptured and blood filled the eye. However, the eye was retained and has some vision, in spite of subsequent atrophy of the optic nerve.

Toxic Amblyopia.

Dr. W. A. Strickler presented Mr. C. T., aged thirty-three years, who first noticed dimness of vision three months ago, which has steadily increased to date. He has been free from pain, headache and other symptoms. His family and personal history are neagtive. The urine is negative. He chews a ten-cent plug of "horseshoe" in forty-eight hours and drinks some, though not regularly. He counts fingers at three feet with each eye, and the fields are contracted throughout, with diminished vision, more marked centrally. The color sense for green, red and blue is fair. There is nyctalopia, but no true scotoma. The temporal portion of each disc is pale, and the nasal side "looks swollen." There may be exudate on the nasal side.

Discussion.—Dr. J. A. Patterson said one side of the left disc was swollen.

Dr. W. H. Crisp thought the retinal vessels occupied different levels, and there were streaks along some of the vessels. Evidently new tissue is forming, and he believes there is a recession of a former active process.

Dr. E. T. Boyd does not think the case can be one of toxic amblyopia.

Dr. F. R. Spencer said very small quantities of wood alcohol, if mixed with grain alcohol, might have produced this clinical picture.

Dr. C. E. Walker thought the etiology was doubtful, so he would stop the tobacco and alcohol. The patient should have a complete physical examination and an examination of the teeth. Potassium iodid and mercury should be given to increase the absorption of the exudates. Dr. Walker likes the deep orbital injections of salt solution, as he believes the atrophy of the optic nerve is in part at least prevented. He makes the injection with a curved needle, superior and external to the eye, but outside the muscle cone. Ten to twenty minims of two per cent solution are used, although he begins with 0.6 to 0.8 of one per cent. There is very little reaction or pain. This is aided by salts given by the mouth. He does not advocate dionin for deep orbital injections.

Dr. O. Orendorff uses Darier's formulæ.

Dr. E. T. Boyd prefers a large amount of strong cyanid of mercury.

Fibroma of Optic Nerve.

Dr. Wm. C. Bane presented L. B., seven years old, first examined in May, 1914. He complained of poor vision in left eye and frontal headache for five or six weeks.

Examination at that time revealed: Vision right eye, 5/5 —; left eye, light perception. Right fundus negative, and left showed optic atrophy. Media clear. Eye unsteady. No record of exophthalmos at that time.

Refraction: Right eye, + 0.75 sph. = 5/5 —; left eye, + 3.00 sph. = light perception. One month later, right eye, 5/4, and left eye, movement of hand at twelve inches.

This patient was not seen again until November 11, 1916, when moderate exophthalmos of left eye was found and the eye directed down and forward. The hyperopia, left eye, is now seven diopters. The accessory sinuses have not been examined.

Diagnosis: Fibroma of the left optic nerve.

Ball has recorded one hundred and two cases, and the left eye is involved more often than the right.

Discussion.—Dr. J. A. Patterson said the left eye was limited in movement up and out.

Dr. W. H. Crisp called attention to an exhaustive treatise on this tumor in a special number of the Royal London Ophthalmic Hospital Reports. There is a reference to this in the Ophthalmic Year Book.

Dr. F. R. Spencer said an X-ray examination should be made.

Dr. J. A. Patterson suggested a blood examination by an internist, and an examination of the nervous system by a neurologist.

Dr. O. Orendorff suggested a modified Krönlein operation, so as to avoid the disfiguration of the older Krönlein operation. He has used the modified technic and likes it.

Dr. W. H. Crisp said the case reports of this fibroma show that it is of slow growth and does not recur.

Dr. C. E. Walker has used a modified Krönlein operation on a bilateral fibroma in a child of eleven years. The tumors were large, but have not recurred. The patient has good vision in both eyes.

Dr. Wm. C. Bane thinks the tumor is near the eye, in the optic nerve, and superior and external to the nerve. It may possibly extend to the brain.

Vernal Conjunctivitis.

Dr. W. F. Matson presented a boy, aged fourteen years, with hypertrophy of the bulbar conjunctiva at the limbus both eyes for the past nine years. He had measles just prior to the disease, otherwise his personal and family history are negative. His nose, throat and tonsils are negative. He has not had hay fever, but his eyes itch in hot weather. He has not been treated.

Discussion.—Drs. D. H. Coover, C. E. Walker and F. R. Spencer confirmed Dr. Matson's diagnosis of vernal conjunctivitis.

Dr. Wm. C. Bane said dilute sodium salicylate gave relief.

Dr. W. H. Crisp suggested refraction and tinted lenses, after excision of the hypertrophic conjunctiva.

Dr. D. H. Coover uses the following prescription: Phenol, grain 1; antipyrin, grains 5; aq. dist. q. s., ounce 1.

Dr. J. A. Patterson cut the "sole leather" hypertrophic bulbar conjunctiva off in one case.

Luetic Neuroretinitis.

Dr. J. A. McCaw presented a young woman with poor vision, diplopia, swollen discs, tortuous retinal vessels, inability to read, metamorphopsia and exudate at macula. Left eye similar to albuminuric retinitis.

The urine was negative and the Wassermann positive. The heart and lungs were negative. Atrophic rhinitis. No scotoma. Right hyperphoria eight and a half degrees.

Discussion—Dr. W. H. Crisp saw this patient in April and May, 1916, at which time she had: Right hyperphoria of four to six degrees, right disc hazy and retinal vessels tortuous. Correction of the right hyperphoria made her comfortable. He thinks her right hyperphoria may at that time have been due to a central luetic lesion.

Discussion.—Dr. C. E. Walker said a right hyperphoria of six degrees is pathologic, especially when it comes on suddenly, and the cause should be determined. He treats these as he would a paralysis, and gives mercury and iodid potassium in large doses.

Dr. W. H. Crisp gives large doses of mercury.

Dr. W. L. Hess advocates vigorous sweat baths.

Dr. F. R. Spencer believes neosalvarsan is better when given intravenously than any of these.

Dr. E. T. Boyd gives mercury by inunction and by injection into the muscles. He believes the blood pressure is too high.

Interstitial Keratitis Due to Acquired Lues.

Dr. F. R. Spencer presented Mr. R. N. First examined October 30, 1916. He stated that his left eye had been inflamed for about a week previous and thought he probably had a foreign body in it. Aged twenty-nine years, miner, married. Eight years ago he had a primary luetic lesion on the penis while in the navy. Admits having had gonorrhea also. Was discharged from the navy five or six years ago and sent to the naval sanitarium at Las Animas, Colorado, for pulmonary tuberculosis.

Examination of the right eye was negative, but the left revealed an interstitial keratitis about two millimeters from the superior limbus, with many superficial and deep vessels extending to this. Since October 30th the interstitial infiltration in the cornea has extended downward one or two millimeters, and there are some deposits on Descemet's membrane from the associated iridocyclitis, although it is hard to recognize these on account of the haziness of the cornea. Vision right eye, 6/4 —; left eye, 6/5 plus and minus.

The right fundus is negative and the left probably is, although the fundus examination of the left has not been very satisfactory because of the haziness of the cornea.

He was given a five per cent aqueous solution of dionin, three drops in the left eye night and morning; also one per cent atropin twice a day.

Nose negative; one tooth showed definite involvement and was immediately extracted by his dentist. The X-ray of the accessory sinuses was negative, but mouth and jaw showed evidence of a former abscess where the upper left second bicuspid had been extracted.

The following is the report from his family physician, Dr. C. L. La Rue:

Family History: Negative.

Past History: Acquired syphilis in the fall of 1908. Contracted tuberculosis in 1910. Sputum was loaded with tubercle bacilli for several months following his discharge from the navy. Was told by several physicians that his syphilis had been cured and that he could safely marry, so two and one-half years ago he was married. His wife and one child, one and one-half years old, are free from clinical signs of lues.

Physical Examination: Heart negative. Small cavity in the upper lobe of each lung.

Diagnosis: 1. Quiescent tuberculosis with cavities. 2. Syphilis (general).

November 5th the blood Wassermann was strongly positive. Neosalvarsan, protoiodid, potassium iodid, etc., were immediately given with great improvement in the interstitial keratitis.

Interstitial Keratitis.

Dr. J. A. Patterson reported the sequence of the case of interstitial keratitis which he presented at the October meeting, as follows:

October 27, 1916, blood Wassermann positive; tuberculous fixation test positive. October 21, 1916, the day she was exhibited, two drams mercurial ointment used by inunction that night. Patient salivated next morning. October 31, 1916, 0.05 grams sodium cacodylate given hypodermically. November 6, 1916, a patch extending from the limbus is slightly wider and extends double the distance upon the cornea. It is a reddish, coppery brown, like ham, consisting largely of blood vessels. Was given one dose of 606 intravenously. Right temporomaxillary joint sore, similar to left, which occurred before mercurial ointment was given. November 16, 1916, eye white for a week at least. Maxillary joints permit her to chew. Gingivitis about well. No synechia when pupil was allowed to contract.

The corneal invasion spreads in a peculiar manner. The ham-colored patch is still spreading toward the center, preceded in all its progress by a crescentic area of almost clear cornea, with most dense infiltration beyond this area toward the center. Luetin test has been absolutely negative. Another dose of 606 was given.

FRANK R. SPENCER,
Secretary.

WILLS HOSPITAL OPHTHALMIC SOCIETY.

Meeting held October 2, 1916. Dr. Samuel D. Risley, chairman.

Report of Cases Illustrating Ocular Complications of Anterior Poliomyelitis.

Dr. William Campbell Posey and Dr. Walter C. Swindells: This report included one case of blindness from atrophy of both optic nerves, with paralysis of left abducens, occurring in a boy seven years old. The eye symptoms appeared three weeks after the primary attack of fever, although an afebrile stage of two weeks supervened between the two. There was also paralysis of the left arm and leg. The attack was attended with pain and rigidity at the back of the neck. However, as there was no ophthalmic evidence of a previous neuritis, the atrophy being of a simple nature, it was thought not unlikely that the atrophic changes in the nerve may have been induced by the direct action of toxins generated by the disease. Dr. Posey said that the implication of the optic nerve in anterior poliomyelitis is exceedingly rare, as he had been able to find but two other cases in the literature, one cited by Wickman and another by Tedeschi.

The authors also reported three cases of paralysis of ocular muscles which they had observed in anterior poliomyelitis, one of paralysis of the left sixth, associated with a similar condition of the seventh nerves. The palsies in this case occurred in a child exposed to infection by his father, a physician, who was attending another case of infantile paralysis at the same time. The paralysis appeared about a month after the initial illness. In the second case, a double ptosis followed directly upon an illness of one week's duration. In the third there was complete external ophthalmoplegia, the paralysis coming on the second day after the illness. Both of these cases occurred in Philadelphia during the recent epidemic.

Discussion.—Dr. Burton Chance said that while he had not had an opportunity to observe cases of infantile paralysis in their active stages, he has had, just as others have had, numerous cases exhibiting sequels of the disease, and his study of the present epidemic very much reminded him of many features connected with the 1899 epidemic of cerebrospinal meningitis, which he studied in the cases committed to the care of the Municipal Hospital. He does not regard, of course, the two diseases to be at all similar or related, as each is caused by a separate organism, yet he was struck by the particular statement of Dr. Weisenburg, that in this present epidemic the affection has not been limited to the myelin, but is actually a meningomyelitis. It therefore is not to be wondered at that he noticed motor and sensory changes in the ocular apparatus. It is to be deeply regretted that ophthalmologic studies have not been made at the Municipal Hospital during this present epidemic, because in the cases in which meningitis has developed, sooner or later serious and progressive changes, it should be feared, may appear. Therefore, he urged, just as he did during his studies in the epidemic of the other disease, that as soon as possible after they are discharged by the hospital, the patients should be sent to receive ophthalmologic study and treatment.

Dr. T. H. Weisenburg stated that he was of course very much interested in the cases of Drs. Posey and Swindells, for during the present epidemic of infantile paralysis he had studied many similar cases in the Municipal Hospital. He was not as yet prepared to state the exact number of cases that he had seen in which the ocular muscles were involved, but he thought that there must have been fully twenty-five or perhaps more.

The ocular complications were of different kinds. He had only seen one in which there was blindness. In this case there was also a complete ophthalmoplegia. Unilateral third nerve paralysis he had seen only once, bilateral third nerve paralysis possibly three or four times. Paralysis of associated ocular movement was found in a number of instances, either to one or both sides. Sixth nerve paralysis was the most common ocular complication. In one case it was seen alone, in two or three cases bilaterally, but in the majority of instances it was associated with seventh nerve paralysis. Most textbooks discussing infantile paralysis state that seventh nerve paralysis is very common and that it occurs alone. This has not been Dr. Weisenburg's experience, for in the majority of instances he found an associated sixth nerve palsy, and in some instances fifth nerve palsy. Fourth nerve palsies were not found alone, but always in association with the third cranial nerve.

In only two or three instances were the ocular cranial nerves involved alone, for in the majority of cases there is an associated paralysis in the limbs and chest and abdomen. It can be taken for granted that whenever ocular paralysis occurs, the infection has been very great and the paralysis is of considerable extent.

The prognosis, of course, varies and depends upon the extent of the ocular involvement. In the sixth nerve palsies, when alone, or with the seventh nerve, there is generally a return to power in two or three weeks or longer. Third nerve paralysis and associated ocular paralysis usually persist longer than paralysis of the other cranial nerves. The probabilities are that most of the cranial nerve paralysis will ultimately disappear, although this is by no means certain. It was Dr. Weisenburg's impression that this epidemic, as judged by the previous epidemics studied in 1910 and 1913, was of greater severity, and that the extent of the paralysis was much greater.

Dr. Risley regretted that ophthalmoscopic study of the fundus oculi had not been made in the cases reported. In former epidemics he had seen two instances of optic atrophy, with nearly complete blindness, following what had been reported as poliomyelitis, and he knew of one case during the present epidemic which had been returned to its home paralyzed in the lower extremities and said to be blind, only mere perception of light having been retained when lying on its cot out on the lawn in bright daylight.

A Case of Bilateral Intraocular Foreign Body.

Dr. William Zentmayer: The patient was a girl, six years of age, who, two weeks before admission, had been injured by an exploding dynamite cartridge. She was brought to the hospital because of loss of vision in the left eye. No injury to the right eye was suspected. The skin in the periorbital region showed numerous small depressed scars, similar to those seen after chicken pox. In the left eye the lens was partially opaque, and the vitreous was filled with a dark mass in which there was a very small macule in the cornea at its lower outer margin. The lens was clear. In the vitreous there was a shining, apparently metallic, oblong foreign body about one-half the diameter of the disc in length and the diameter of a main trunk of the central vessel in diameter. The anterior pole was pointed to the temporal side. It was located in the horizontal meridian and was best seen with + 4. D. In a line with the foreign body there was a small irregular whitish lesion in the retina. The radiograph showed on the left side numerous small foreign bodies scattered through the orbit and eye; on the right side there were two shadows. No response was obtained by application of the magnet to the sclera.

Dr. Zentmayer asked for an opinion as to the proper treatment of the case. He did not feel justified in attempting to remove the foreign body with forceps through a scleral wound as the eye was now in practically a normal condition aside from the presence of the foreign body. He thought the case should be watched and on the first appearance of irritation or synchysis an attempt at extraction should be made.

Discussion.—Dr. Risley was of the opinion that if the metallic fragment hanging freely in the vitreous were not copper or brass, more injury was to be expected from attempts at removal than from the undisturbed retained body. He was glad to know that this was the opinion entertained by Dr. Zentmayer and by Dr. Sweet. He had had the opportunity to see Dr. Sweet's patient, and was glad to hear from the report just given that the conclusion to do nothing but keep the case under observation had shown the wisdom of such course. He had seen many examples where foreign bodies in the vitreous chamber and in the lens had remained innocuous for many years.

Case of Herpes Zoster Ophthalmicus.

Dr. Burton Chance exhibited a man who has recently recovered from the active symptoms of herpes zoster ophthalmicus. In his experience this case presented the widest involvement in area. The dermal lesions extended from the lower orbital margin on the left side, involving the lids, the lacrimal region of the nose, straight up over the forehead back to the interparietal line and over on to the temporozygomatic region. There was intense edema of the lids on the unaffected side. The ala of the nose was not affected. The conjunctiva was edematous from the beginning, and an efflorescence at the inner and outer margins of the limbus occurred by the end of the tenth day, and later a localized cloudiness of the cornea developed. There was moderate iritis. There were no pareses of the extraocular muscles. The case has progressed favorably; the deep, rut-like scars on the forehead are becoming shallower, yet the man cannot wear his hat because of the excruciating anesthesia dolorosa, and so far his quite thick head of hair has not been affected. A somewhat dense opacity in the interstitial lamina can be made out by means of the corneal magnifier. The medical treatment consisted chiefly of the use of hot magnesium sulphate stupes and the internal administration of sodium salicylate. Just before the vesicles ruptured, tincture of iodin was applied over the forehead and into the scalp.

Meeting held November 14, 1916. Dr. Samuel D. Risley, chairman.

Dr. William Campbell Posey showed the following cases:

An Unusually Large Mucocele of the Frontal Cells Which Had Simulated an Osteoma of the Right Orbit.

Drainage had been effected by a long incision under the brow, perforation from the frontal cells into the nose, and the insertion of a large caliber drainage tube from the sinus into the nose. The development of the mucocele had been gradual over a period of nine years, had been unattended with pain or other inflammatory phenomena, and notwithstanding a high degree of downward and outward displacement of the globe, vision had not been lowered.

Prelacrimal Tumor in a Young Colored Woman, From Enlargement and Disease of the Anterior Ethmoidal Cells.

A cure had been effected by orbital incision and drainage of the cells into the nose by breaking through the ethmoid plate and inserting a large drainage tube. Dr. Posey said it was his usual custom to close the orbital wound in cases of this nature, permitting the sinus to drain directly into the nose, but this rule had not been followed in either of the cases just referred to, on account of the great amount of mucous discharge in the first case and the amount of inflamamtory reaction in the orbit in the second case.

Congenital Ptosis and Lack of Upward Rotation of the Eyes.

A baby eight months old had congenital ptosis and lack of upward rotation of the eyes, with associated marked dilatation of the veins in the skin of the upper lids, more especially on the left side. There were no vascular changes elsewhere about the eyes and nothing in the history which gave a clue to the origin of the venous swelling.

Monocular Tubercular Interstitial Keratitis.

A case of monocular tubercular interstitial keratitis in a young girl, which had progressed most favorably under increasing doses of old tuberculin, administered hypodermatically.

Monocular Interstitial Keratitis.

A case of monocular interstitial keratitis in a young man apparently due to acquired syphilis. Marked improvement followed the use of mercurial inunctions.

Iridocyclitis Following Perforating Injury.

A case of iridocyclitis following perforating injury through the ciliary body by a stone. Enucleation advised. Another similar case, the ciliary body having been perforated by a hat pin.

Intense Uveitis With Corneal Infiltration.

A case of intense uveitis with corneal infiltration in an eleven-year-old girl with vaginitis of three months' standing. The ocular involvement was thought to be due to metastasis.

Blepharoplasty for Restoration of Upper Lid.

Blepharoplasty was done in a girl aged twenty-two years for the restoration of the upper lid, which had been lost from orbital inflammation in childhood. The flap which was taken from the forehead included a small portion of the brow, with the view to creating a row of cilia upon the new lid. A mucous lining was provided by carefully dissecting the small remnant of mucous membrane which was confluent with the skin underneath the brow, reflecting it downwards and sewing it temporarily to the lower lid. Union had been prompt, and Dr. Posey said it was now his intention to remove the phthisical globe, to place a gold ball into Tenon's capsule, and later to insert an artificial eye. Naturally, the artificial cilia would not be tolerated by a healthy eye, on account of the continued irritation to which they might give rise, but he thought a judicious penciling of the row of hairs fringing the flap might add considerably to the setting of the artificial eye. He had deferred the removal of the phthisical eye until the new lid had been properly formed, on account of the support it gave the flap.

Congenital Anomaly of the Optic Nerve and Choroid.

Dr. Wm. Zentmayer reported the case of a woman thirty-five years of age, who had a congenital anomaly of the optic nerve and choroid. She stated that her vision had always been defective, especially in right eye.

In the right eye there were two large wing-shaped areas of defective choroid, which spread out from the optic nerve to the temporal and nasal parts of the fundus. The defect in the choroid was complete. The papilla was oval and presented at the scleral ring on the temporal side a porous opticus through which the retinal vessels emerged. M. = 50.

In the left eye the choroidal defect was much less extensive and not complete, the choroidal vessels being present and showing, in places, sclerosis. M. = 3 D. The right eye was divergent, but this had been almost corrected by an O'Connor advancement of the internal rectus.

Opacity of Both Lenses With Diabetes.

Dr. S. D. Risley presented for a study a man, aged forty years, with an apparently soft and flocculent opacity of both lenses. When admitted to the wards ten days earlier, the opacity was complete and the lenses swollen, but projection was good in all parts of the field. While in the hospital the swelling had markedly subsided and much of the anterior cortex had cleared, leaving a clear space behind the border of the dilated pupils. He had been brought to the hospital by his physician, Dr. Lavas, for extraction of his cataracts, who reported that the man had been under his care for diabetes. but that the percentage of sugar had been so far reduced he believed an operation advisable. Examination, however, by the house staff revealed a high percentage of sugar and the urine had a specific gravity of 1042. This had not diminished under treatment and restricted diet in the hospital. During the preceding twenty-four hours the man had passed two and a half gallons of urine of a specific gravity 1036, with eight per cent sugar. The entire quantity was shown, and the laboratory analysis by Dr. Brinkerhoff, the pathologist of the hospital, given as follows: "No acetone, diacetic or oxybutyric acid, no albumin or casts."

Discussion.—In answer to inquiry, Dr. Risley thought it possible that there might be some relationship between the obvious clearing of the anterior cortex of the lens and diminished swelling, and the evacuation of such an enormous quantity of sugar in the urine. The case stood alone in his experience, not only in the clearing of the lens cortex, but in the excessive amount of urine passed in twenty-four hours so heavily laden with sugar.

Regarding prognosis in the extraction of cataract in diabetic patients, Dr. Risley thought it on the whole favorable, and reported that he had had four such patients in the house at the same time a few years ago, all of whom did well after extraction and pursued a quite normal convalescence. He felt it important, however, that diabetes should be regarded as a disease of impaired metabolism; that the uveal tract of the eye upon which the cataract depended was a local manifestation of the general disorder and should be treated accordingly. The case he had shown was the first in which he was ready to believe that the presence of sugar was primarily the cause of the opacity of the crystalline lens. The anterior ciliary vessels were not engorged, nor were there any other demonstrable symptoms of uveal disease.

Juvenile Glaucoma.

Dr. S. D. Risley presented from the wards a bright girl, aged seven years, assigned to his clinic on October 30, 1916, suffering from distressing photophobia and lacrimation in the left eye, the right being healthy with vision equaling 6/6. Tension was twenty millimeters. The tonometer reading in the left eye showed apparently fifty-seven millimeters, plus two, estimated by palpation. The cornea in both eyes was very large, but in the left the anterior sclera was apparently distended and showed the engorgement of the anterior ciliary vessels characteristic of increased tension of the globe. The eyes were not painful, and there had been no headache. The condition was recent, the child having attended school in a grade beyond her age until three weeks before. On the cornea in the lower nasal quadrant, just before the corneal pole, there was a break in the epithelium presenting much the appearance of dendritic keratitis. The break was one millimeter wide and approximately three and a half millimeters long, extending from near the corneal pole downward and inward. There w what appeared as a deposit of discrete spots on the membrane of Descemet, but not so dense as to prevent a study of the fundus with the electric ophthalmoscope, which showed a deep glaucomatous cupping of the optic nerve and a choroidal disturbance increasing in severity at the periphery of the ophthalmoscopic field.

She received internally one grain of quinin sulphate four times daily, and locally an alkalin lotion and eserin salicylate four times daily. Two days later the photophobia had disappeared, and the break in the corneal epithelium could be discovered only as a faint gray line by oblique illumination, but just above it, to the nasal side, a kidney shaped area one millimeter by two millimeters in size, seen only by favorable illumination, appeared to be an opening or break in the membrane of Descemet, which now appeared faintly gray around it, the discrete deposit upon its surface having disappeared. Dr. Risley regarded the case as one of buphthalmos or juvenile glaucoma. The right eye was healthy. The child was then admitted to the ward and the treatment continued, with marked improvement in the ciliary engorgement, while the tension had fallen to normal, as estimated by palpation. Dr. Risley commented upon the untrustworthy reading of the Schiötz tonometer in such a case. The curvature of the much enlarged cornea did not conform to that of the instrument, and therefore the spud could not be pressed home. On inquiry by a member of the society, Dr. Risley said that he had advised a broad peripheral iridectomy which he purposed doing in the near future at a favorable stage of the disease, and felt that without an iridectomy his full duty would not be done to the case.

Case of Purulent Ophthalmia With Vaginitis.

Dr. S. D. Risley thought that since the infection of the eye had begun as a corneal ulcer, with subsequent involvement of the conjunctival sac, the infection was in all probability direct rather than metastatic.

Enucleation of Left Eye and Insertion of Gold Globe in Capsule of Bonet.

Dr. S. D. Risley presented for study a patient for whom he had enucleated the left eye and inserted a gold globe in the capsule of Bonet. The point of interest was the technic of the procedure. After separating the conjunctiva from the globe, the tendon of each of the four recti was in turn seized through the conjunctiva and subconjunctival tissue in the grip of strong forceps, the tendon severed from its attachment to the globe and a deep stitch introduced and held back by an assistant. After enucleating the ball a gold globe was inserted and the sutures closely drawn and tied at the center; a conformer was then introduced and bandaged. The only event of interest in the convalescence was a marked chemosis of the conjunctiva which disappeared after removal of the conformer. The result was a freely moving prominent stump instead of the empty socket usual after ordinary enucleation.

Mule's Operation.

Dr. Risley also exhibited a man upon whom he had done a Mule's operation in 1898. He still had a perfectly healthy, freely movable stump. There was apparently no tendency for the escape of the glass ball, which had then been inserted, and no evidence of thinning of the sclerotic over it.

Glaucoma.

Dr. P. N. K. Schwenk reported the following case of supposed glaucoma, on which he had done a posterior sclerotomy, iridectomy, lens extraction and capsulotomy, with full restoration of vision with correcting glasses:

Mrs. M. S. (colored), aged fifty years, came to Wills Hospital May 15, 1915, with the history that six weeks before she was confined to bed with "la grippe," when she suddenly lost the sight of right eye, followed in two weeks by same condition in left. The patient presented the following on first visit:

Eyes slightly divergent. Left eye: Orbital axis fixation, cornea clear, pupils slightly dilated, sluggish reaction to direct light, lenses cataractous, whitish in appearance. Right eye: Pericorneal zone deep scleral injection, vessels enlarged. Tension plus two. No light projection or candle field, no fundus reflex.

He put patient off until conditions became necesasry to relieve tension and pain. In consultation with Dr. Fisher, who advised posterior sclerectomy, he admitted her to the wards of the hospital on May 29, 1915, and did a posterior sclerotomy on June 8, 1915, followed two days later by an iridectomy—discharged her on June 29th with eserin and salicylates.

On October 12, 1915, she was readmitted and Dr. Schwenk did a lens extraction on October 14, 1915. To his surprise she began having light projection and enlarged candle field. On October 29, 1915, a capsulotomy was done. Today the patient has vision of 6/5, mostly with a $+ 10.0 \overset{\frown}{\smile} 1.0$ cyl. ax. 30°.

Dr. Schwenk stated that this case was instructive from two viewpoints: First, the case presented all the evidences of glaucoma and seemed hopeless as far as improvement of vision was concerned, but because of some pain with tension plus, the patient was admitted to relieve these symptoms, which led to further indications to produce a clear field, or better study of the interior of the eye. The tendency or temptation was not to interfere, as the case seemed hopeless. The second point to lay stress on is the beneficial results obtained by posterior sclerotomy in a large percentage of cases in glaucoma before doing the iridectomy. In three cases he had done sclerotomy, iridectomy and lens extraction at the same time. In his experience posterior sclerotomy with iridectomy with upward incision is the operation of choice. The Elliot operation should be performed only in cases of necessity or blind eyes.

Conjunctivitis Complicated by Infiltration of Orbital Tissues.

Dr. Burton Chance presented, because of confusion in diagnosis, the case of a negress of about thirty-five years, who had been under Dr. Fisher's care fifteen years ago, when, besides symptoms of neuroretinitis, there was proptosis, which proptosis it was then believed was caused by orbital tumor or cellulitis. The symptoms at that time were alarming, and the corneas, especially the right, became more or less necrosed by the exposure incident to the protrusion of the globes. Large doses of iodids were believed to have allayed the symptoms and reduced the protrusion. The patient continued without symptoms until early in October of this year, when, in addition to protrusion of the globes, accompanied by immobility, there was enormous chemosis, and the patient was practically blind when she came under Chance's care. The chemosis was so great and the corneas so cloudy that it was impossible to view the eye grounds. There was a moderate yellowish conjunctival discharge. From October 17th until today this discharge contained the pneumococcus organism abundantly, which could be demonstrated by smears and by cultures. Roentgenograms disclosed no involvement of the adjacent sinuses, and nothing indicative of neoplasms of the orbits were shown. Wassermann reactions were repeatedly negative. Today the refraction, which is myopic, gave a quite high result at four meters. The discharge is now watery. The chemosis has entirely subsided and movements of the globes have returned. The treatment has been that of rest in bed, cold compresses, inunctions of iodid of mercury in ascending strength, over the entire period. Chance does not regard it to be a case of gumma of the orbit. It would be singular to have the two orbits affected alike, and to the same degree, and there should not, of necessity, be such chemosis accompanied by pneumococcic organisms. He therefore is inclined to the belief that he has had to deal with an extreme case of conjunctivitis complicated by infiltration of the orbital tissues.

Lacerated Wounds of the Eyelids and Cornea.

Dr. Chance also presented a case of lacerated wounds of the eyelids and cornea, which had received primary treatment elsewhere before coming under his observation. A negro man, of about twenty-two years, had been assaulted while asleep by a companion, who broke a small glass dish over his face. The lids, to the outer side of each punctum, were lacerated quite completely, in a line extending from the brow and the lower orbital margin, which severed the lacrimal canals. The cornea also had a clean linear wound, which had become entirely united and the healing well advanced. The line of the laceration was evenly curved. Today, at the third week, the healing is complete, but distinct ectropion of the lower lid is present, with annoying epiphora. Chance intends to tunnel a new passage for the tears so soon as he believes cicatricial contraction has become complete.

Meeting held December 4, 1916. Dr. Samuel D. Risley, chairman.

Synchronous Movement of Eye and Jaw.

Dr. Paul H. Kleinhans presented a boy, eleven years of age, with synchronous movements of eye and jaw. The mother had noticed from birth that the upper lid of the right eye drooped, and some years later it was remarked that the movements of the mouth in chewing were always connected with an up and down movement of the right eyelid. There was no family history of a similar anomaly.

Examination showed in the primary position almost complete ptosis of the right lid. On opening the mouth the lid shot up. Lateral movements of the jaw had no effect on the lid. Examination showed insufficiency of the right superior and internal rectus muscles. There were no fundus changes, and vision in each eye was normal.

Discussion.—Dr. W. C. Posey said that cases of this nature were quite rare, and recalled a case of a Hebrew girl, seventeen years old, whom he had reported to the College of Physicians some years previously. In this case the right lid had drooped from birth, and it was elicited that since earliest childhood it had been remarked that when she chewed or rotated her jaw the lid of the right eye would move up and down. There was an associated overaction of the right superior rectus muscle, due to insufficiency in the right inferior rectus.

Dr. Posey said that Sinclair, who had written an able treatise on the subject in 1895, had found the most common class of cases of this kind to be those in which certain movements of the lower jaw are associated with an upward movement of the upper eyelid. In this class there is one-sided congenital ptosis, with or without paresis of the superior rectus. The drooping eyelid cannot be voluntarily raised, but is vigorously raised when certain movements of the lower jaw occur. Sinclair further subdivided the cases in this series into four subheads:

Group 1.—Cases of one-sided congenital ptosis in which the drooping eyelid is raised both when the mouth is opened (digastric) and also when the jaw is directed to the opposite side (external pterygoid).

Group 2.—Cases of one-sided congenital ptosis in which the drooping eyelid is raised when the jaw is depressed, but is not raised with lateral movements of the jaw.

Group 3.—Cases of one-sided congenital ptosis in which the drooping eyelid is raised with lateral movement of the jaw (external pterygoid action), but not with simple opening of the mouth.

Group 4.—Cases in which similar associated movements of one upper eyelid with movements of the lower jaw occur, but in which there is no ptosis.

The explanation of the association is difficult and must be purely hypothetical, as no cases as yet have come to autopsy. The theory which is usually accepted is that the levator receives nerve supply from the motor nucleus of the fifth nerve as well as from the nucleus of the third. Others have thought of a nuclear connection between the third and seventh nerves, and there are still others who presuppose a connection between the nuclei of all three nerves. While there is ground for belief in the imperfect development of the third nerve nucleus in a number of the cases, as is evidenced by insufficiency in the action of superior and inferior rectus and other muscles supplied by that nerve, this is not true of all, for, as has been stated above, other cases have been cited where all the muscles supplied by this nerve performed their functions normally, the associated movements between the lid and jaw being the only anomalous conditions present.

Dr. William Zentmayer noted that when the gaze was directed below the horizontal plane the left palpebral fissure became of the same width as that of the right side and continued so in complete infraduction. Associated movements between the eyes and other facial muscles, especially between the orbicularis and the alæ of the nose, are said by Harmon to be very common. Dr. Harlan, some years ago, showed a case allied to the one now exhibited, in which blepharospasm was induced by jaw movements.

Dr. Burton Chance said that the number of cases exhibiting jaw winking are so few that every opportunity should be taken to place on record any instances of the syndrome whenever they occur. The case exhibited today recalled to his memory one which he had in his private practice a number of years ago, all the features of which he could not exactly recount, but it differed from today's case, and from the majority of those systematically reported, in that instead of there being a ptosis which disappears when the mouth was opened, his case showed drooping of the lid during mastication. The patient was a comely lady of nineteen years, in whom the defect could not be observed except when she was eating.

Monocular Trachoma in the Early Cicatricial Stage.

Dr. Wm. Zentmayer exhibited a case of monocular trachoma which was in the early cicatricial stage, and on which he had performed the Kuhnt-Heisrath operation. The result has been very satisfactory, a dense pannus, which had previously been present, having almost entirely disappeared.

Dr. Zentmayer said that he had now performed this operation in cases representing all the stages of trachoma except that of advanced cicatrization, and in every instance the result had been gratifying.

Tuberculosis of the Anterior Segment of the Globe.

Dr. Wm. Zentmayer exhibited a case of tuberculosis of the anterior segment of the globe. The patient was a married woman, thirty-two years of age. Pregnant three times. First time had abortion performed because of exhaustion from vomiting. Second, child born dead. Third, miscarriage at three months. Wassermann and provocative Wassermann both negative. Wassermann upon her husband also negative. Vaginal smears and cultures negative. Von Pirquet negative. Had an abscess of impacted molar, which was removed. Had exophthalmic goiter. Gland removed January, 1915. In right eye there is a tongue-shaped area of haze in the cornea, superficially vascular. Pupil irregular from almost complete posterior synechia. Delicate fibrinous exudate on anterior capsule. Mutton fat drops on Descemet's membrane. Anterior chamber shallow. Fundus negative. Left eye in much the same condition. Anterior chamber deep.

The patient had been under very energetic and appropriate treatment by Dr. Weinberger of Sayre, to whom Dr. Zentmayer was indebted for the previous history of the case, but the condition had not progressed favorably.

Congenital Cataract in Which Nucleus Dropped Into Anterior Chamber Following Discission of the Lens.

Dr. Zentmayer reported a case of congenital cataract in which, following a second discission of the lens, the nucleus dropped into the anterior chamber and was removed by passing a keratome into the anterior chamber behind the nucleus, making slight pressure upon the cornea as the keratome was pressed back, allowing the nucleus to escape along the blade of the instrument. Notwithstanding that the pupil appeared round, there was a slight attachment of the iris to the corneal scar. Ordinarily Dr. Zentmayer preferred to treat congenital cataract in children by repeated discissions. He considered this method to be the safest one, and he did not think that the element of time required for absorption of the lens should be considered a serious objection to this method when other procedures risked the loss of vitreous and prolapse of the iris. The method proposed by Dr. Posey required a preliminary discission, a linear extraction, and doubtless often a final capsulotomy, as many operations as are ordinary required by simple discission.

Discussion.—Dr. S. D. Risley said there were many things to consider in the management of socalled congenital cataract; that his experience showed in the majority of cases the opacity was not present at birth, but had come on during the first few years of life. In very many instances, after the removal of the opaque lens and capsule, choroidal disease was revealed and was obviously the cause not only of the opaque lenses, but of the failure to secure good vision, even by the most successful operations. He had seen endarteritis, extensive choroidal atrophies, and disseminated absorption areas. The cataracts, therefore, were to be regarded as part of a vicious inheritance which was seen later in the abnormal development of the teeth and other evidences of impaired nutrition. Therefore, a cautious prognosis should always be given. As to the methods of procedure for the removal of the opaque lens, he had adopted as the operation of choice that described at the last meeting of the society—i. e., a vertical incision in the capsule and anterior cortex, and twenty-four to forty-eigth hours later the insertion of a keratome at the upper corneal limbus, the point of the instrument being carried into the substance of the lens, making a section at right angles to the previous wound in the capsule. The instrument being then slowly and partially removed, the point pressed backward so as to prevent the prolapse of the iris, but allowing a slight gaping of the corneal wound, thereby permitting the escape of the opaque flocculent cortex over the anterior surface of the keratome. It is true that in the group of cases shown at the previous meeting of the society, two of them exhibited a slight anterior synechia at the upper angle of the anterior chamber, but whenever this occurs it is due to a fault in technic. After the extrusion of the cortex in the manner described, he had usually inserted a small flexible spatula, and with gentle pressure stroked the iris, pressing out from behind it any cortex which might remain. This he had neglected to do in the two cases seen by Dr. Zentmayer, and it was probably the slight pressure by this mass back of the iris which led to the adhesion of the latter to the wound. He would hesitate to return to the tedious method of frequent discission of the lens which he had employed for so many years, and with the defects and advantages of which he had long been familiar. The lessening of the days spent in the hospital, the better results obtained, and the freedom from the dangers of repeated needlings, made, in his opinion, the procedure he had described the one of choice.

Dr. Chance was much impressed by Dr. Risley's belief that the general health of the average subject of congenital cataract is not good, but frequently presents dyscrasias, vascular disease, or other depressing factors. And, in confirmation of this belief, Chance offered his observation of the difference between the recovery from the effects of traumatic cataract in young subjects, and the dissolution after operation on cataracts congenitally formed. He has been frequently surprised by the apparent ease with which disintegrated lenses in aseptic cases have been absorbed, whereas most carefully needled lenses may require months for absorption, being frequently accompanied by inflammatory symptoms.

Dr. Posey said that it was his custom to needle the lens quite thoroughly, and to remove the swollen lens matter a few days later by curettement, making an incision for this purpose about two millimeters from the limbus of the cornea in the horizontal plane, the lens matter being caused to extrude by inserting a cylinder Daviel spoon in the opening and keping the instrument in a plane with the iris. Often the entire lens mass might be removed by this simple method. In other cases a later discission of any remaining lens substance was necessitated.

He thought it best to defer operating, in cases of congenital cataract, until the age of three or four years had been attained, for the longer the surgeon waits the more the eye develops and the more apparent does the exact nature of the lenticular opacity become, and the dressing and bandaging of the eye is easier and there is less danger of infection.

Sometimes attempts at needling are frustrated by the tenacity and density of the lens capsule. Good results can be obtained in this class of cases by the displacement downwards of the opaque tissue. He advised, however, an attempt at needling in the usual manner in even these cases, for the discission serves as an exploratory procedure, enabling the operator to judge of the consistency of the tissue with which he has to deal, and at the same time exposes whatever lens matter may be present to the solvent action of the aqueous humor.. Displacement should be resorted to only when needling fails and a tough resistent substance still blocks the pupillary area.

Dr. Frank Fisher said that for rapidity of recovery, safety and final good result the best method of dealing with congenital cataract is by free discission, followed in forty-eight or seventy-two hours by complete curettement. With a Hayes knife the lens can be thoroughly divided in different directions —broad rents being made in the anterior capsule, and preferably in the posterior capsule also—exposing as much as possible of the lens matter to the aqueous. In forty-eight or seventy-two hours thereafter, depending upon amount of cortical swelling and the tension created thereby, do the curettement.

Two or three millimeters from the upper limbus is the point of election. A broad needle, bent on the flat, yields best result, with which an incision from four to five millimeters is made parallel to the limbus. A Daviel curette introduced with point well to the center of the pupil, and well back of the level of the iris and with slight backward pressure against the upper lip of the wound, will begin the evacuation of the chamber. Gentle pressure upon the lower cornea with spoon or spatula, while the curette remains in the chamber, will complete the entire removal of the lens matter.

The presence of vitreous in the hyaloid fossa, or in the aqueous chamber, during or after the needling, or even in the corneal wound during the curettement, is a negligible factor, so far as results are concerned, provided the wound is thoroughly cleared of shreds of hyaloid before closing.

If the cataract is of nuclear form originally, it frequently happens that the harder nucleus is forced forward into the aqueous chamber by the swelling cortex after needling. This need not be regarded as a complication, the small mass being easily removed during curettement, and by the same process.

His experience favors early operation for congenital cataract, yet it should not be done earlier than the second year. There is usually so little reaction after either the needling or the curetting that small attention may be given to bandages after the first twenty-four hours—merely slight protection being required.

Inquiry should always be made as to family history. Frequently more than one in a large family of children is afflicted with congenital lens trouble. In three generations of one family congenital cataract occurred as follows: First generation, three members, one case; second generation, five members, two cases; third generation, six members, two cases.

Imperfection of the Iris.

Dr. Burton Chance presented a case of imperfection of the iris which he considered to be allied with polycoria, and not unlike, in certain respects, the case exhibited by Dr. Schwenk at the last meeting. In the case shown today there was the remote history of inflammation of the left eye in an Italian girl of eleven years, in her early childhood, who had been sent to the hospital by the school physician. There was present a linear cicatrix or opacity in the cornea which doubtless interfered so much with the sight that the physician had regarded the case as one which required refraction. There were no visible signs of connection between the corneal nebule and the iris, neither were there evidences of disease of the lens, the choroid, or the retina. On casual inspection there appeared to be a horizontal coloboma at the outer side, which, on closer inspection, was found to consist of imperfectly developed superficial layers of iris, with a dense hyperplastic overdevelopment of the deeper fibrous layer. The fibers extended quite visibly for some distance above and below the main aperture, and shone through the feebly developed overlying layers, which condition was not distinctly seen at some distance from the eye. In addition, directly opposite at the nasal side, there is a circular aperture, which, when the ophthalmoscope is used, transmits the light through a distinctly fibrous background. In the right eye, in an exactly corresponding position at the nasal side, is a similarly rounded area which has the appearance of being only the deepening of a crypt, and does not transmit the fundus glare. Atropin effected complete mydriasis, when the eye was found to be entirely normal. Atropin in the left eye caused contraction of the nasal pillar, but apparently had no effect on the temporal.

Operation for Repair of Contracted Socket.

Dr. Chance also desired to show the immediate effects of an operation which he undertook two days before for the repair of a contracted socket. The patient is the woman upon whom he performed the "Maxwell" operation to affect the lower lid, exhibited before the society a year or so ago. The "Maxwell" procedure had yielded most satisfactory results in so far that the lower lid, instead of extending far into the floor of the orbit, had become sufficiently everted to give room for a modified glass eye. The transplanted island of cheek tissues had increased the cavity of the orbit in that locality by so much as the dimension of the island. The upper lid was so distorted and so matted and drawn up into the orbit, that the "Maxwell" procedure could not be considered suitable; but by the advice of Dr. Schwenk, and with his assistance and direction, he determined to undertake that procedure which Dr. Schwenk devised for the relief of a case under his care in December, 1915, the principle of which consisted in the separation of the mucous membrane adherent to the orbital mass by a submucous dissection, together with the subcutaneous dissection of the skin of the lid from the tarsal tissues, and in connecting the cavities thus formed by severing the intervening tarsal tissues. A new cul-de-sac was formed by uniting the interior surfaces of the mucous membrane and of the skin by means of three mattress sutures. An elliptical shaped piece of sheet lead was then inserted into the mucous cavity. Bandages were applied, and today, on the removal of the "lead conformer," a quite freely movable lid is present, behind which is a distinct cul-de-sac.

Sudden Blindness Supposedly Due to Wood Alcohol.

Dr. S. D. Risley reported a case of sudden blindness which had applied for treatment at his clinic a few days before. The man (a young Italian) had gone to bed in the evening without any impairment of vision, but woke in the morning totally blind. The ophthalmoscope revealed no cause for the man's misfortune. Investigation brought out the fact that for two weeks the man had been drinking a beverage which seems to be a favorite with the laboring men among the Italians, and which is made up of a quart of alcohol, one pound of granulated sugar, and three quarts of water, to which is added the contents of a two-ounce bottle of extract called "orsa rossa" (red rose), red in color, the chemical nature of which was not ascertained. This mixture is boiled and used as a beverage. It occurred to Dr. Risley that wood alcohol might have been used in composing the mixture, but a specimen shown by the man's wife, who had purchased the ingredients, proved to be grain alcohol. As soon as inquiry about the alcohol was made she became suspicious, and there was room for doubt as to whether the specimen furnished was the same as that employed in the mixture. No other cause for the sudden onset of blindness could be discovered.

Dislocation of Lens Into the Anterior Chamber.

Dr. W. C. Posey exhibited a case of dislocation of the lens into the anterior chamber, in a man about sixty years of age. There was a subluxation of the lens of the other eye, due to a congenital weakness of the zonule of Zinn, a brother about the same age showing a similar weakness in each eye. Dr. Posey proposed to remove the lens from the anterior chamber by a linear incision.

Harold W. How,
Secretary.

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XIV.

SOME PHASES OF THE DIAGNOSTIC AND THERAPEUTIC USES OF TUBERCULIN IN UVEITIS, ILLUSTRATED BY FOUR CASES.*

Hiram Woods, M. D.,

Baltimore.

I want to present the essential features of four carefully studied cases of uveitis, thought to be of tubercular origin, three of which were treated with tuberculin. These cases seem to justify the study of three phases of this form of therapy:

1. The possibility of permanently damaging vision by a focal reaction.
2. Advisability of omitting a focal reaction and relying for diagnosis upon a positive von Pirquet or other diagnostic measures for tuberculosis, after elimination of other causes.
3. Conditions indicating the use or avoidance of tuberculin.

Case 1.—Permanent damage to vision following the diagnostic use of tuberculin. Mrs. S., thirty-one years of age, mother of three children, consulted me on August 2, 1912. The right eye was destroyed two years previously by central choroidoretinitis. Vision in the left eye had been poor for ten days. Her previous history was negative, save convulsions before the birth of her second child. She had been subjected to repeated systemic examinations. No serologic tests had been made.

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*Read before the twenty-first meeting of the American Academy of Ophthalmology and Oto-Laryngology, Memphis, Tennessee, December, 1916.

Examinaiton showed: Right eye, central and paracentral scotoma, foveal choroidoretinal atrophy, with numerous spots of disseminated atrophy throughout the fundus. Left eye, central vision, 20/40; form and color fields normal. On the lower periphery there were numerous pigmented atrophies with minute grayish yellow deposits, certainly of recent date, near the temporal disc margin.

She was sent to the hospital for clinical study. Nothing abnormal was found except a high specific gravity in the urine (1030) with indican in excess. A Wassermann on the blood serum was reported negative. Temperature, taken every two hours for two days, showed no variation. Then on August 4th an internist associated in the case gave one-half milligram of tuberculin for diagnostic purposes. There was no temperature reaction: the sole observable result was focal. Five days after the use of tuberculin she complained of diminished vision in the left eye; it was 20/100. The vitreous was more cloudy, and between the fovea and disc there was a new choroidal exudate. The patient went home after another week, unimproved. While there she took mercury under the direction of her physician. She returned to Baltimore after three months, with vision the same as when she left (20/100); a paracentral color scotoma, contracted form field and an atrophic spot near the fovea. A second blood serum Wassermann, made by another serologist, was reported "feebly positive." In view of the fact that Mrs. S. had taken mercury during the three months spent at home, he believed that the diagnosis of lues should be accepted.

The points I want to emphasize are:

1. Presence in each eye of atrophic areas, while the better eye showed, in addition, such signs of acute disease as fresh exudates and cloudy vitreous.

2. The speedy occurrence of new trouble in the acutely affected eye after injection of tuberculin with permanent lessening of vision.

3. Meaning of positive reaction in the second Wassermann

test. In view of the first negative Wassermann, the feebleness of the second and the decided tubercular reaction, I am inclined to think the diagnosis of syphilis not proved.

This is a matter of some importance, in view of a suggestion by Theobold Smith.[1] In a paper from which I quote later, he speaks of living organisms, when introduced into a body infected with another virus, becoming pathogenic. True, living organisms are not used in human beings; but the effect of various preparations of dead organisms is the same, only to a less degree. It is certainly conceivable that a vaccin which would react only slightly in a body not otherwise infected, might cause greater damage because of previous infection.

Case 2.—Rapid extension of choroidal exudate following diagnostic use of tuberculin. Miss A. R., nineteen years of age, Jewess, public school teacher, consulted me December 31, 1915, for floating spots and blurred vision in the right eye, of a fortnight's duration. Both eyes were myopic to nearly five diopters. With correcting glass, right eye had 20/30 central vision, left eye 20/20. A fine descemetitis could be made out in the right eye. After mydriasis there was found slightly cloudy vitreous with a large choroidal exudate in the lower nasal field.

Examination, including sinuses, teeth, blood serum Wassermann reaction, etc., showed nothing save a slight enlargement of the right lobe of the thyroid. The patient was sent to the hospital and put to bed. The temperature, taken every two hours for two days, showed no fluctuations. Then on the advice of Dr. H. D. McCarty, who thought that such a dose could do no harm, I consented to a subcutaneous injection of .001 milligram tuberculin for diagnostic purposes.

Three days later, temperature reached 100° and there was circumcorneal congestion; also, along the border of the choroidal deposit originally observed, except at its lower and outer margin, there was a deepening of the red color of the fundus. This was displaced in two days by a new grayish yellow exudate. Vision fell to 20/40 (—). This focal reaction subsided after two weeks, when the patient was given a .00001 milligram O. T. as a therapeutic measure. During the four months following, Miss R. received twelve injections of tuberculin, the strength gradually increasing to .01 milligram. She usually showed circumcorneal reddening, but no other reaction. Her central vision became normal in six weeks, and has remained so ever since. A small incut, found in the temporosuperior field in the beginning, gradually cleared. She has had no treatment since June, 1916, and has remained perfectly well.

I have cited this case to show the possibility of a severe focal reaction from a reasonably small dose of tuberculin. Her rapid improvement may or may not have been due to this vaccin. I do not believe we can say positively, for the case was acute, and nature might have done the same thing without our help or interference, as the case may be.

Case 3.—One eye lost from uveitis, the other apparently saved by tuberculin. T. B. (colored), aged twenty-two years, waiter, was first seen April 11, 1913. Married; has one healthy child; had lived in a house with two sisters, who had died of tuberculosis. In the summer of 1912 his left eye was lost from uveitis. The globe was shrunken, sclera thinned, tension minus, pupil occluded, and the lens opaque. He claimed light perception. So far as I could determine, mercurial treatment had been administered during the attack in the left eye.

Right eye showed steamy cornea, descemetitis, posterior synechiæ, with vitreous too turbid to admit of fundus examination. Vision was moving hand at two or three feet. He was sent to the Presbyterian Hospital, and Dr. Gordon Wilson kindly examined him for me. Clinical examinations and Wassermann reaction on the blood serum were negative. From April 19th to 21st, temperature remained normal or below; pulse, 90. A von Pirquet was ordered, and the resident physician was entrusted to make it. Probably he overdid it; at any rate, in forty-eight hours there was violent arm reaction, temperature rose to 101.6°, the eye became more injected and painful. I am inclined to think there was an accidental subcutaneous test. We decided to limit treatment to atropin and dionin until temperature reaction should cease and the inflammatory lesion should become nonprogressive. It was nearly a month, May 17th, before this was accomplished. The patient was then admitted to the Municipal Tuberculosis Hospital, in Dr. Wilson's service. There was no vision except the moving hand. There were present deep circumcorneal injection, adherent pupil and muddy vitreous. He remained in the

Municipal Hospital until September 16th (four months), with the exception of one week in July. He received altogether twenty-two injections of tuberculin, all after the first two being bouillon filtrate. The dates of administration, the size of the doses, and such notes as were made at the hospital are appended.

RECORD OF INJECTIONS AND DOSES WITH DATES.

May 28, 1913. 1/10,000 T. R. Temperature rose from 96° to 98 2/5°. No entry of focal reaction.

June 3. 1/100,000 B. F. No note of reaction, local or otherwise.

June 7. 1/10,000 B. F.

June 11. 1/100,000 B. F.

June 15. 1/5,000 B. F. Elevation of temperature from 97° to 99 1/5°' For one week (until 22nd) had oscillating temperature; generally subnormal, not exceeding 99°. From 6 a. m. on 22nd to 12 noon on 23rd, temperature, 97° to 99 1/5°.

June 23. 1/5,000 B. F. Temperature, 98°.

June 28. 1/5,000 B. F.

July 2. 1/5,000 B. F.

July 5. 1/5,000. Temperature elevated one degree.

July 9. 1/3,350. Slight oscillations of temperature, all below normal.

Patient at home from July 16th to 24th.

July 26. 1/3,300. Low variation in temperature continued, from 96° to 98 3/5°.

August 8. 1/2,500.

August 12. 1/2,500.

August 15. 1/2,000. From then to 20th, highest temperature 98 1/5°, lowest 95° (on two occasions).

August 20. 1/2,000.

August 23. 1/2,000.

August 27. 1/1,888.

August 30. 1/1,888.

September 2. 1/1,500.

September 10. 1/1,500.

September 12. 1/1,200.

September 14. 1/1,000 B. F.

September 16. Dismissed. Temperature usually from 95° to 98°. 99 1/5° only on two occasions, and followed injection of 1/3,300 B. F.

Evidently, Dr. Wilson's purpose was to gradually increase to a point just short of febrile or focal reaction. The man received no other general treatment, while locally atropin and dionin were continued.

He was discharged from the Municipal Hospital, September 16, 1913, with normal central vision. He has been at work since and came to my office at my request on April 3rd of this year. The lost eye (left) is unchanged. In the right eye there are a few adhesions along the lower pupillary border. An area of choroidal atrophy is seen in the upper and temporal fundus, with numerous small pigment deposits elsewhere, especially around the fovea. He had 20/20 vision and seemed in good health.

I call special attention to the avoidance of tuberculin so long as the case was in an advancing stage.

Case 4.—Chronic disseminated choroiditis with repeated circumcorneal injection and scotomata; the former apparently controlled, the latter diminished by tuberculin. Mrs. W. B. R., forty-five years of age, consulted me first in July, 1908. The right eye had been useless for a year or more from disseminated choroiditis with central atrophy. Vision was: right eye, 20/200 (?); left eye, 20/20. If there was any trouble in the left eye at that time, my notes do not indicate it. Mrs. R. presented the appearance of perfect health. She lived in the country, and, outside of what she termed "chronic rheumatism," had never been ill. The one significant thing in her family history was that four brothers had died of tuberculosis. She had been examined repeatedly and nothing found. At that time (1908) I only corrected her presbyopia.

I did not see Mrs. R. again for five years, May, 1913. She then came on account of recurrent redness in either eye. There was episcleral and circumcorneal injection in her left eye. This eye (the good one) showed numerous patches of disseminated choroiditis, chiefly in the upper and inner fundus. Figure 1 shows her left field at this time (note the large scotomata). Central vision was 20/20, in spite of a fine descemetitis. She was being treated by her physician with salicylat of sodium, on the theory that rheumatism was causing the eye congestion. This treatment was continued for five weeks, or to July 2nd, without appreciable change.

During June she had repeated injections about the cornea of one or both eyes, with vitreous clouding. Vision varied from normal to 20/40. Field unchanged.

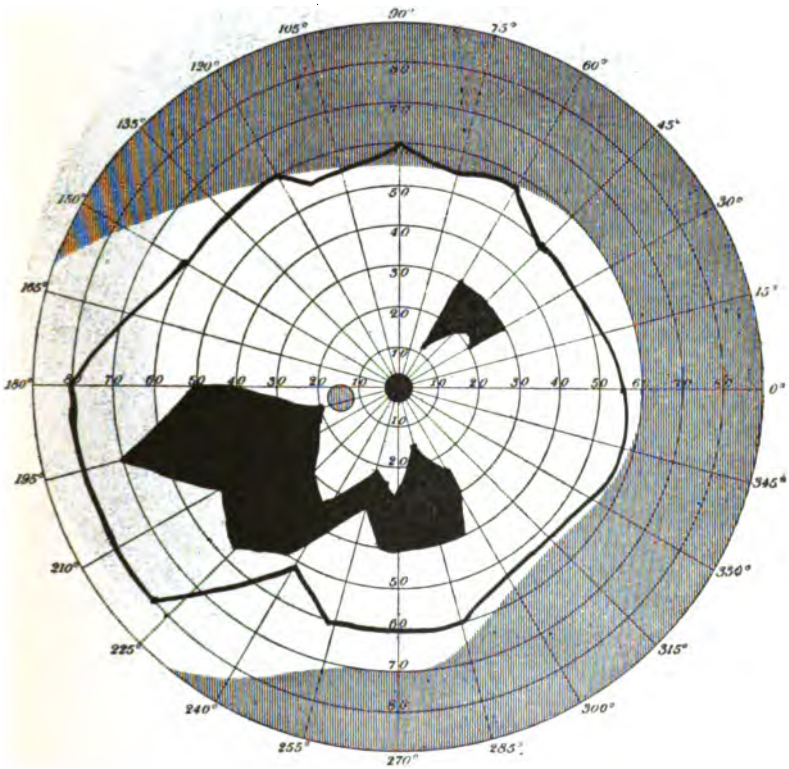

FIGURE 1.

Case 4. Left eye. May 30, 1913. Before tubercular treatment.

I then asked Dr. Wilson to see her with me on account of the tubercular family history. After a thorough clinical examination, which was negative, we decided to use the von Pirquet test, recognizing, however, its small value in adults.

Both of us had always been timid about producing intraocular reaction. This dread, at first theoretic, was confirmed by case 1. The von Pirquet test was made by Dr. Wilson himself, and was positive. It was then decided to make no attempt to obtain focal reaction and to put Mrs. R. on therapeutic doses of tuberculin. She was accordingly given:

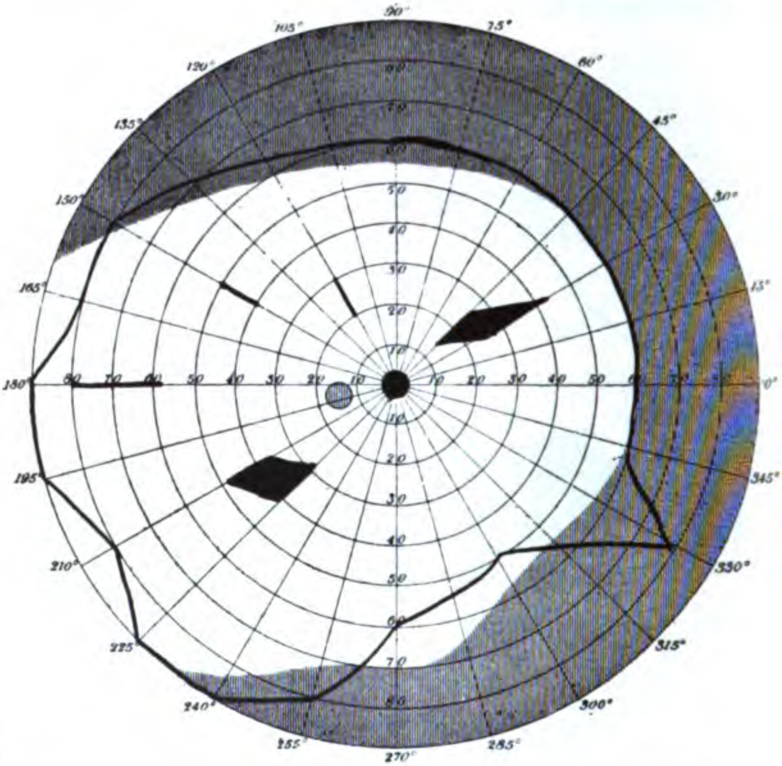

FIGURE 2.

Case 4. Left eye. October 2, 1914. After fifteen months of treatment.

Tuberculin B. F. (human) 1/1,000 milligram.

Normal salt solution with ½ of 1 per cent phenol, 10 cubic centimeters. Give 2/10 cubic centimeters of solution once a week.

Thus she was to get 2/100,000 milligram once a week from her family physiican until further orders. This dosage was continued without febrile reaction for six months (December, 1913), when Dr. Wilson advised addition of 1/100,000 milligram to the weekly dose (2/100,000) until this should reach 8/100,000 (1/12,500). This was accomplished by the end of January, 1914.

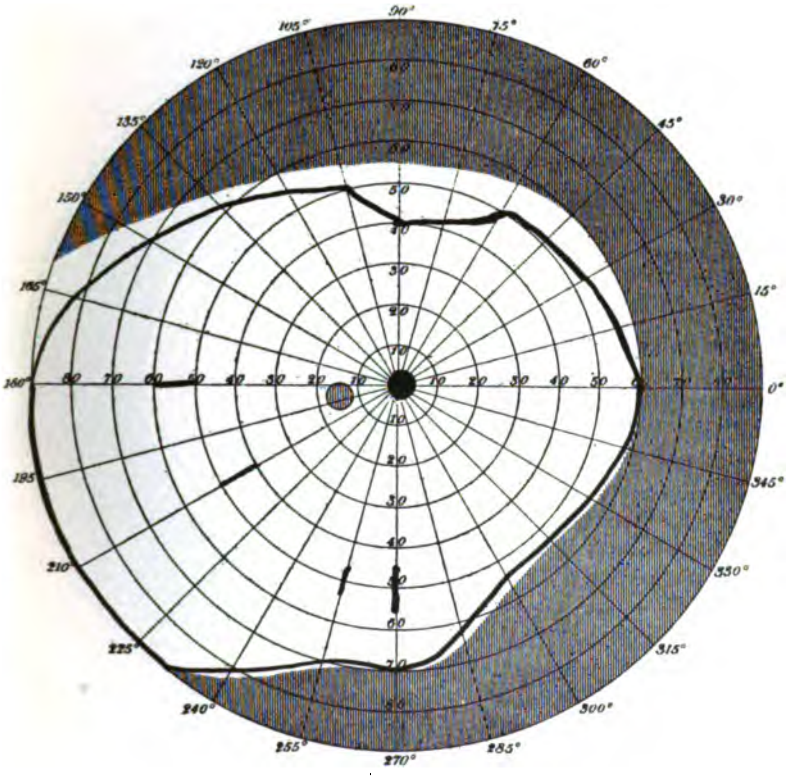

FIGURE 3.

Case 4. Left eye. October 23, 1915. Maximum improvement reached after twenty-two months of treatment.

On February 2, 1914, there was the first evidence of improvement—diminution in size of the scotomata. A weekly injection of 8/100,000 milligram of tuberculin was continued until May 10, 1914 (ten months from the time of starting), when it was stopped because of freedom from trouble for the preceding three months. After two weeks (May 28th) circumcorneal injection reappeared in the right eye. Early in June tuberculin was renewed, with the initial dose of 2/100,000 milligram every ten days, and increased as before. The chart

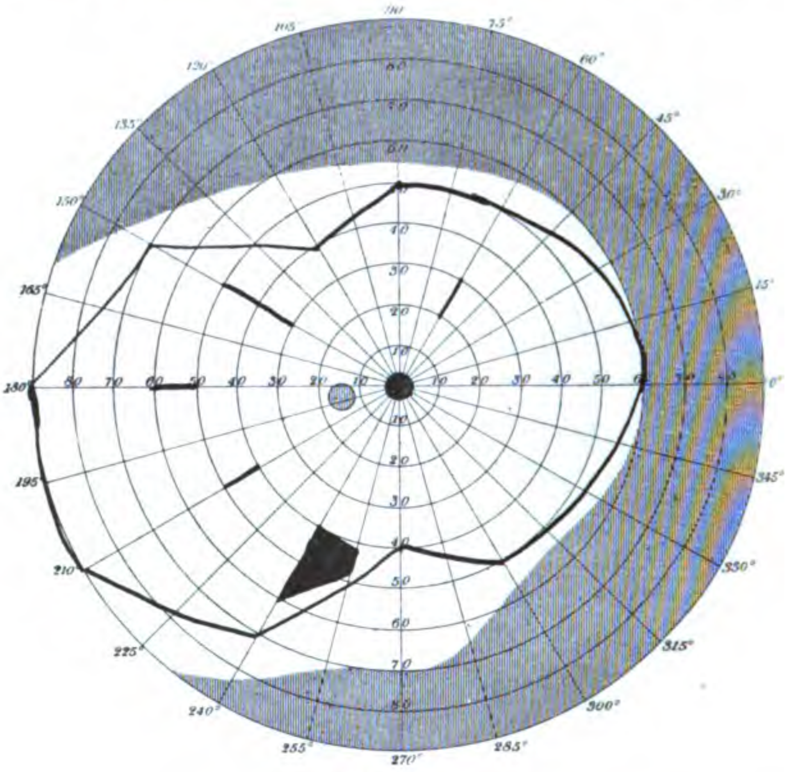

FIGURE 4.

Case 4. Left eye. May 26, 1916. First relapse after a year without treatment.

(Figure 2, of October 2, 1914) shows an enormous improvement in the scotomata. On the 17th of December this was maintained. Central vision was 20/15. Tuberculin was then discontinued. On the 13th of March, 1915 (three months later), small scotomata reappeared. There had been occasional circumcorneal injection of either eye. Tuberculin was given as before, with gradual increase to 8/100,000 milligram, starting April 1st. She reported to me toward the last of May with a history of no further discomfort. Tuberculin was

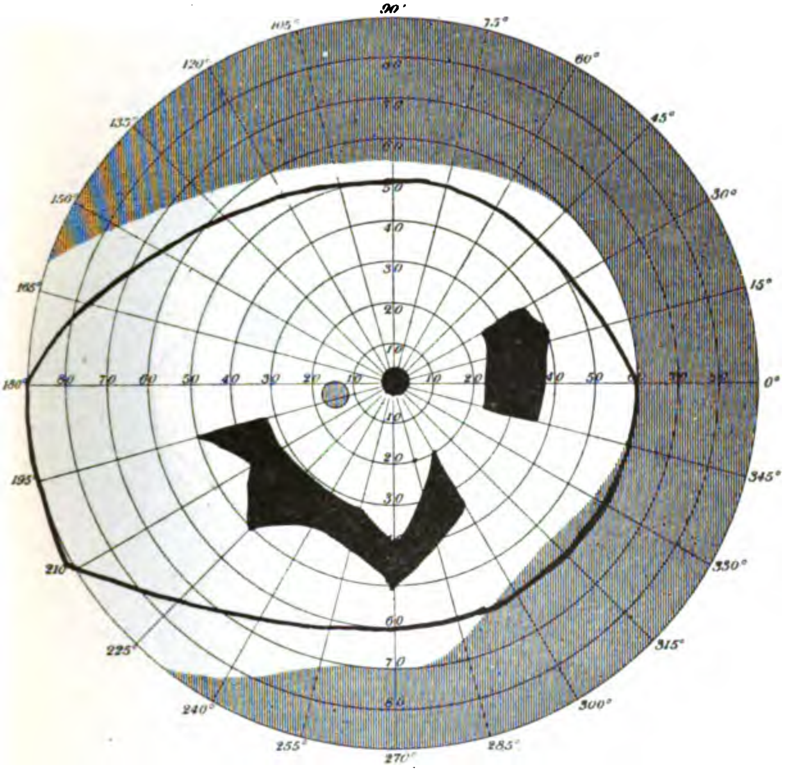

FIGURE 5.

Case 4. Left eye. October 30, 1916. Five months later, without treatment, though ordered.

stopped. She was not seen again until October 23, 1915 (practically five months without treatment). History was negative and field normal, except for blurring of the five millimeter white disc at a few points (Figure 3). In February, 1916, this same condition persisted (seven months without treatment, with no symptoms). However, on May 26, 1916 (practically one year after discontinuance of treatment), the circumcorneal injection returned, and a small scotoma appeared in the lower and outer quadrant (Figure 4). On May 26th tuber-

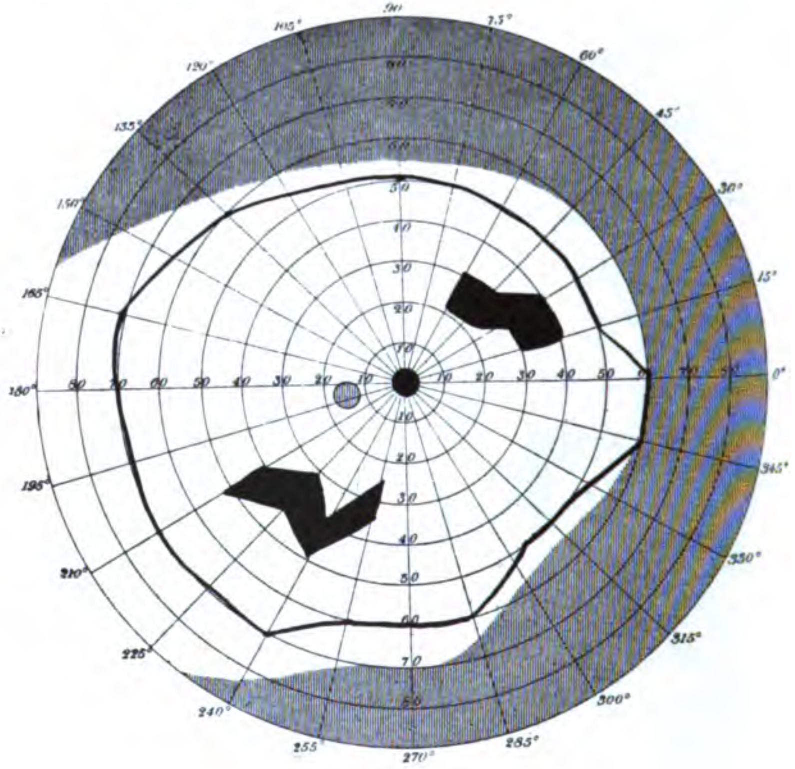

FIGURE 6.

Case 4. Left eye. November 23, 1916. Improvement after three injections.

culin was renewed, continued for a month, and stopped without orders from us. I saw her on July 21st, when she urged us to go back to the tuberculin, saying she felt better when taking it. Her physician was instructed to continue it in moderate doses (1/100,000) once a week during the summer. However, he went away from home, and Mrs. R. received no tuberculin from July until her next visit to me, October 20, 1916, when it was renewed. Her eyes were again congested, and the scotomata were enlarged (Figure 5).

She reported again on November 23, 1916. She had had 2/100,000 milligram of tuberculin on November 3rd, 11th and 18th. She complained of some headache, but the scotomata were definitely smaller (Figure 6). Recent clinical examination by Dr. Wilson was negative save for a blood pressure of two hundred, an increase of fifty in the last three years, suggesting, possibly, further vascular changes. Urinalysis at the time was negative for albumin and sugar, though an examination of a twenty-four-hour specimen was impossible. Dr. Wilson advised the continuation of a 1/100,000 milligram of tuberculin without increase for two months, unless reaction should occur.

Points to be noted: Tuberculin treatment of eight months' duration before improvement; relapses during twenty-two months whenever injections were discontinued; then a year without symptoms and in consequence without treatment.

I have grouped these four cases because they present useful points in the diagnosis and treatment of uveitis. What is the average attitude of the oculist to the study of underlying causes in this disease? The first things he thinks of are syphilis and tuberculosis. Doubtless there are some who still cling to rheumatism; but most of us have learned that in acute articular rheumatism we seldom see uveitis, and that what we call chronic rheumatism may be one of a great many things, the exact diagnosis often being impossible. After a Wassermann test, if negative, investigation for tuberculosis naturally follows. Here we are confronted with a practical difficulty. Ocular tuberculosis, especially of the uveal type, is usually a local lesion. Nothing positive is found by clinical examination and we are thrown back on vaccins. Nothing short of a focal reaction is certain. Is a focal reaction safe, and how much tuberculin should be given?

As regards safety, in my first case the focal reaction promptly and permanently lessened vision, and in the second might have done the same, had it occurred nearer the fovea. The doses in these two cases were one-half milligram and 1/1,000 milligram—a wide difference. Basing my judgment upon the teaching of these cases and observations of men who are more familiar with tuberculin reaction than we can possibly be, I have come to the conclusion that the dose which will produce a focal reaction is absolutely unknown in any individual case until tried; and that if we determine to push tuberculin until such a focal reaction is obtained, we are deliberately assuming a risk.

Again, do we need a focal reaction? In a given case, there may be a history of tubercular exposure, local ocular lesion without other symptoms, an absence of other causes and, finally, a negative or positive von Pirquet—where do we stand? It is generally conceded that two or three negative von Pirquet tests justify exclusion of tubercular diagnosis. We all know that a positive reaction indicates nothing more than an infection at some time in the previous life, and maybe a healed or limited lesion. But is not this all we need? Are we not safer in beginning then with minute therapeutic doses, with gradual increase, until we find the patient's point of tolerance, than by insisting upon a diagnostic focal reaction in the beginning? In Cases 3 and 4 this course produced splendid therapeutic results. If it be argued that we are not sure of the diagnosis and the course is tedious, I would say that, even so, it is better than damaging vision by diagnostic zeal. Of the two cases benefited by tuberculin, one has remained well, while the other shows tendency to relapse when without the vaccin. It seems that tuberculin, short of curing, can supply an increased resistance: that the patient misses it, and it may be our duty to supply it by small doses for an indefinite period.

Theobold Smith[1] says: ". . . . all parasites, ... induce in the body of the host a degree of antagonism higher than that existing before the invasion. This antagonism may not be sufficient to eliminate the parasites; it may not even be strong enough to check the march of invasion and the progressive disease resulting therefrom; it may even in some of its stages be injurious to the host. . . . . . In a body already infected with some other virus, living vaccins may cooperate with this virus and become pathogenic for that individual. . . . . . Localized bacterial infections are processes toward which the human body in general possesses a high degree of natural resistance. . . . . . It is impossible to separate the toxic from the immunizing product."

Finally he says: "In conclusion, let me briefly summarize the points to be emphasized. All parasites tend to increase the resistance of the host in which they live and multiply. Out of this universal fact a number of practical problems arise. In any given disease is it worth while to try to raise this immunity? And how much energy will it cost the patient? If worth while, what is the best and most sparing way of raising such immunity artificially? In any localized infection we must ask: Is this a beginning process without an attendant immunity, or is it a residual process associated with general immunity? If the latter, vaccins may be considered safe. In processes associated with fever and bacteremia science says: Hands off until we know whether we have a progressive disease, with gradual undermining of the resistance, or a mere localized affection in which the excursions into the blood are secondary. In any case, the use of vaccins in these cases must be regarded as experimental, and should not be undertaken save in conjunction with one trained in immunologic problems."

What, as ophthalmologists, can we learn from this?

1. That infection induces in the host its own antagonists, but not always enough to check the process, and that this antagonism may be in itself injurious. An obvious deduction is that we, as eye clinicians, ought to know if this latter state exists before we induce more antagonism. What shall tell us?

2. The human body possesses "a high degree of natural resistance" to "localized bacterial infections."

Uveitis is a localized lesion. Consequently, Dr. Smith's concluding question comes home with great force. In a given case are we dealing with "a beginning process without immunity, or is it a residual process with general immunity?" In the former case, nature is manufacturing antagonists. If we try to help, we may add just enough to push the patient over the damage line; for we cannot separate "toxic from the immunizing products." If it be a "residual process"—that is, if there be present none of the symptoms which we call "acute," but a condition which lags and relapses and will not get well—we can infer that nature has reached her limit.

Dr. Smith shows us how the internist should go at the problem. He should watch for fever and other evidences of bacteremia. He should give nature all the show she wants, or she may rebel. But local eye lesions do not produce enough systemic disturbance to give this information. We are forced to reason on local conditions. To us, advance of the process in a short time, descemetitis, intense congestion, turbid vitreous, etc., are guides. While these are advancing the process is not "residual."

The following conclusions seem to present the proper attitude of ophthalmologists to the use of tuberculin for diagnostic or therapeutic purposes:

First, avoidance of focal reaction in intraocular lesions.

Second, avoidance of tuberculin as a therapeutic measure in acute cases. Under "acute" there should be included duration and advance of the lesion, as indicated by condition of the vitreous, descemetitis, etc.

Third, tuberculin is indicated when the trouble is nonprogressive, but does not get well.

Fourth, a positive von Pirquet, with elimination of other causes, is sufficient basis for the use of tuberculin in therapeutic doses.

Fifth, the present status of vaccin therapy is so uncertain, in the opinion of even those most expert and experienced, that ophthalmologists owe it to their patients to conduct this treatment under the guidance of one trained in "immunologic problems."

REFERENCE.

1. Smith, Theobold: "An attempt to interpret present-day uses of vaccins." Journal A. M. A., Vol. LX, No. 21, p. 1591.

XV.

THE INTERNAL SECRETORY SYSTEM AND THE EYE.*

ROBERT SCOTT LAMB, M. D., F. A. C. S.,

WASHINGTON, D. C.

It was my purpose, when sending the title of this paper to our president, to arrange the eye symptoms which were most often found in connection or could be definitely associated with or caused by disorders of any certain gland among the glands of the internal secretory system in such a way as to make it possible to aid somewhat, or to a great degree, in the diagnosis of glandular oversecretion or insufficiency.

It is possible that at present few symptoms could be so thoroughly identified with imbalance of any one gland as to be considered pathognomonic of either increased or decreased secretion. As a matter of fact, the imbalance in any one gland is apt to bring about a reaction in another, or even several glands, so that the earliest symptom becomes combined or confused with other symptoms, the result of multiglandular secretion admixing in the blood or other tissues and causing intensified stimulation or antagonistic stimulation.

Therefore, there need be no apology for any present inability to clearly define the exact effect of the introduction into the blood of any secretion from any one gland.

Nevertheless, we must endeavor to associate with each known secretion any symptom or symptoms which may either be caused or modified by it. For, as I have elsewhere pointed out, many of the patients suffering from disorders of one or more glands of the internal secretory system usually consult the oculist for headache as much as ten years prior to the general manifestations sufficiently noticeable to call for the advice of their regular physician, and early correct diagnosis may save much mental and physical suffering and some invalidism.

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*Read before the twenty-first meeting of the American Academy of Ophthalmology and Oto-Laryngology, Memphis, Tennessee, December, 1916.

It is to this task then I set myself, and the statements herein contained summarize the findings resulting from this study of never-ending and intensely absorbing interest.

I am sorry to be compelled to epitomize, because an elaborate discussion would serve better in an attempt to understand what has been done in the embryology, anatomy and experimental physiology of the endocrine system; however, I have to take for granted a preliminary survey or previous study of this subject by every one of us.

It is of course impossible for us to consider the effects of internal secretory imbalance without frequently realizing the close association with the sympathetic proper and the vagus or autonomic system.

Some secretions stimulate one system, some the other; for instance, thyroid stimulates the sympathetic and thymus the autonomic system.

When the sympathetic is stimulated slightly and not reinforced or antagonized abnormally, there is a transient dilatation of the pupils, a slight retraction of the lids, etc.; but when the stimulation is prolonged or reinforced, such signs appear as Kocher's or Rosenbach's (Hoeman's) or Stelwag's; and when this reinforcement and stimulation can be sustained for a length of time or can be multiplied in intensity over a shorter period of time, such symptoms as Gifford's, von Graefe's, or even a typical picture of Graves' disease (Basedow's), may occur. Such a condition usually occurs when the adrenals are strong and the sensitization of the plates of Langley is produced by thyroid hypersecretion.

In some such cases the pupils may be smaller than would be expected, but this is because of thymus or posterior pituitary secretions introduced into the blood having an antagonistic action.

In fact, an upset to the balance of secretions sufficient to cause such an outward physical appearance as Graves' disease is bound to be multiglandular oversecretion, with the secretions from certain glands dominating.

When the vagotonic or autonomic system is stimulated there is an immediate tendency to contracted pupils, narrower than normal palpebral fissures—esophoria—spasm of accommodation, congestion (deep) of ciliary body, and chorioretinal and scleral vascular disturbances. The thymus and pituitary favor such conditions. The more chronic inflammations may usually arise in conjunction with vagotonia, but such a condition as simple glaucoma is probably the end result of gonadal and adrenal insufficiency. Whereas acute inflammatory glaucoma is probably the result of a sudden imperative demand upon the adrenals for secretion to sustain the body in its attempt to defend itself against shock, fear, etc., in the presence of gonadal and adrenal insufficiency; for although the secretion is forthcoming for a short period, the inability to continue to supply it causes a precipitate lowering of sympathetic tone and throws the balance under the control of the vagus. This of course in the presence of predisposing factors, such as high hyperopic eyeballs and other anatomic abnormalities.

This idea of the etiology is substantiated by the fact that pilocarpin and adrenalin, by hypodermic injection, overcome the attack; and, furthermore, stimulation to the sympathetic is well known to be always beneficial.

In internal secretory imbalance there may be esophoria or exophoria, depending on whether the dominating secretions are stimulating the vagus or the sympathetic.

Changes in vascularization become arterial activity or venous passivity; intraocular, as chorioretinitis; acute or chronic, or extraocular, as ciliary or conjunctival congestion, bright red or dull garnet red, depending on sympathetic or vagus stimulation. Disturbances of vision occur.

Visual acuity diminishes in either case, and the difficulty of finding proper correcting lenses is markedly increased. Such patients often go the rounds for more reasons than one, inasmuch as their headaches continue.

Binocular fixation is hard to maintain, and the patient tires easily, and asthenopia is progressive.

Hemianopsia may occur, as in the case of hyperplasia of the anterior pituitary—a bitemporal hemianopsia—yet other disturbances of retinal circulation, causing transient subjective symptoms of scotoma, as scintillating scotoma, are doubtless due to abnormal endocrine secretions.

Is it presumptuous to have suggested so many possible changes in our conception of the etiology of ocular symptoms? Having studied the literature of experimental physiology relative to substances derived from the endocrine glands, as far as I have been able to obtain it, and having observed closely the therapy of these substances on normal persons and others known to be suffering from disturbed function of one or more glands of this system, I firmly believe it is not presumption. Furthermore, I feel sure as you consider what I have suggested and contribute whatever information you may derive from your own observations of the influence of these secretions, normal and abnormal, upon the eye and its appendages, you may transcend to even higher flights in this expanse of present-day romance in medicine.

XVI.

CATARACT OPERATION AS IT IS DONE BY SPANISH AND LATIN-AMERICAN SURGEONS.*

JUAN SANTOS FERNANDEZ, M. D.,

HAVANA, CUBA.

It is more easy for us to talk about this subject because of our recent trip to Spain in order to attend the annual meeting of the Spanish-American Ophthalmological Association, which was held at Valence, Spain, on September 20-23, 1916. We took an active part in the Congress because we had been honored with the reading of the official theme, which was on "the present state of cataract operation," and we gave our opinion, which was according to what we had seen in our last trip to the United States, at the end of 1915 and the beginning of 1916.

Cataract operation is today the best studied intervention of all ophthalmic surgery, and the one in which the advances made by the auxiliary sciences have had a fruitful application. As we have often said before, cataract operation is the combined result of the imaginations of two savants: first the superior mind of Daviel, who made the extraction, surrounded as he was by the backwardness of the ocular pathology of those days, and then the great imaginative genius of his colleague, von Graefe, who perfected the work of his predecessor. By the two of them the foundations of the actual ophthalmologic progress were laid, and this progress was made the more solid by the discovery of local anesthesia and the findings of bacteriology. We have, therefore, arrived at a time in which any given method, for they all run inside the same circle, gives good operative results in cataract extraction. The various methods, however, offer some difficulties at times, and it is necessary to follow some procedure which in some way would guarantee that something that occurs rarely would not do so, and that thing is the hernia of the iris, a complication that jeopardizes success in cataract operation.

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*Read before the twenty-first meeting of the American Academy of Ophthalmology and Oto-Laryngology, Memphis, Tennessee, December, 1916.

At another time we said that the method which avoids these dangerous complications is the combined extraction with the conjunctival flap, and we called it the "American method," for we had seen it almost regularly done by the American surgeons in the United States. This year at the Congress held at Valence we maintained the necessity of adopting that method when one wants to have a safe result. Our views were opposed by a great many of the colleagues who attended the Congress, but we think that in doing so they had in mind only the theoretic point of view, and not the practical difficulties that many of them had themselves found in their practice, and we know that many of those who were opposed to the method really practiced it when confronted by some difficulties.

Nobody doubts that the eye operated by the simple extraction always gives a nice after-result from an esthetic point of view, but sight is such a blessing that one can sacrifice somewhat to the esthetic if by so doing we can insure a greater degree of safety to our patient.

If we were disposed to follow each one of those opposed to our views in their daily routine practice, we are sure that we would frequently see the combined extraction done by them as well as the conjunctival flap, because that operation is the summum of surety, and they would either practice a preventive iridectomy or make it at the time of the operation, especially if the patient is impatient and wants his eye operated before the lens is compact. This last thing should not be done, but many do it because if they do not, somebody else will. All this proves that they have more trust in the iridectomy and that there has not been the frankness required to confess that the combined extraction requires more skill, because the excision of the iris is not an easy operation and has some dangers from which the simple extraction is free. In the simple extraction as done by us only the knife and forceps are needed, because our assistant holds open the eyelids. Those are the only instruments that we have used and that we actually use, because in the majority of the cases it is more easy and of more effect to use only one instrument. We make the breaking of the capsule with the knife also. We cannot ignore the dangers that may occur in the simple extraction.

To make the extraction with iridectomy and conjunctival flap—that is, to make what we call the "American method of cataract extraction"—it is really necessary to be equally skilled with both hands in order to operate each eye with the corresponding hand. We have no such skill, and believe that at our old age shall not have it, but we recommend to all beginners to follow that practice in order to possess a safe method that gives good results. If we had been obliged, therefore, to make a review of the opinion of the Spanish and Latin-American oculists, we would have been obliged to say that they do not favor as a method of "guarantee" the combined extraction with the conjunctival flap. It is not necessary to say that in recommending a procedure in medicine, more than in any other science, we should always have in mind that to each rule there are some exceptions and that there should be some adaptations to every individual case; but, all in all, we insist that an eye operated by the combined method with the conjunctival flap is more free from accidents or unexpected complications. Those may arise in the most well-made operation, and one can never tell what the result of a cataract case will be until a large number of days have passed.

We could say that the resistance offered by the Spanish and Latin-American ophthalmic surgeons is similar to that seen in some colleagues in the United States, also, who practice the simple extraction in their cases, it being hard for them to change from their usual method to another, which, although more safe, cannot be mastered until one is equally skilled with both hands.

We want to express our opinion before the profession, and it is the result of our constant actuations in the clinics and our frequently published papers on the subject, and not the fruits of imagination. To conclude, we can say that owing to the high degree the progress in cataract operation has reached, the extraction with iridectomy and conjunctival flap, which we have called the "American method," is the most safe method and the one that gives more guarantee and around which are admitted all the advances that the operative practice can determinate.

XVII.

LUPUS VULGARIS, PARTICULARLY IN ITS INVOLVEMENT OF THE OCULAR STRUCTURES.*

BURTON CHANCE, M. D.,

PHILADELPHIA.

Lupus vulgaris occurs so seldom in the practice of ophthalmologists that the case presented by Dr. Hughes should arouse all our interest. The occurrence of cases presenting the effects of the disease upon the ocular structures has been more or less frequent in the large dispensary services, but this is the first time that I have seen the disease in its active stages. In the early years of my practice I saw several healed cases, mostly in children born in Ireland, and recently I have seen from time to time an elderly Irish woman, who has, in addition to extensive scarring of the left side of her face, involving the ear, ectropion and erosion of the entire ala of the nose. Because of my early experience, my interest in the disease has been so keen that several months ago I prepared a systematic account of the affection, which I ask the privilege of reading to the section, as my part of the discussion of the case presented by Dr. Hughes.

This manifestation of tuberculosis involving the dermal tissues at times invades the ocular structures also. The affection is so rare in America that both dermatologists and ophthalmologists of wide experience have seen but few cases in this country, but in Europe the disease has been seen frequently. Because of the likelihood that an increasing number of cases might be seen here in immigrants in coming years, a somewhat extensive account of its manifestations will be given.

The disease is marked by a chronic specific cellular infiltration of the skin, characterized by the formation of small dark red nodules beneath the surface; the nodules increase in size, and in time coalesce to form appreciably elevated patches. The nodules themselves are soft; so that they may become absorbed, or they break down and ulcerate, to be followed by more or less cicatrization. The disease owes its origin to an invasion of the integument by the tubercle bacillus.

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*Read at the meeting of the Section on Ophthalmology, College of Physicians, Philadelphia, December 21, 1916.

The disease, though common on the continent of Europe, is, as has already been stated, comparatively rare in America; certain dermatologists have declared that they have not seen it in natives of this country. Its manifestations are milder when seen here than when seen among Europeans. It is a disease of early life, generally manifesting itself between the third and sixth years, invariably, however, before puberty, at which period of life it has been found more commonly in girls than in boys. In the case before us, the man is about twenty-two years of age; the history of his disease is not exact as to its incidence; yet because of the ravages of it about his nose, it may be presumed that the infection occurred at least ten years ago. It occurs more frequently in the debilitated and in those whose family history are evidences of general tuberculosis; yet, though it affects more frequently the ill nourished, the anemic and the victims of bad housing, it is not confined to them. This patient, however, is very well nourished, but his family may be said to be distinctly tuberculous. I have no notes of a case occurring in a negro; this man is truly black. Measles or the effects of traumatisms, it is believed, may act as exciting causes, because it has been seen to develop soon after such affections, but the direct cause of the disease is the tubercle bacillus. The view that the dermal lesions were tuberculous was held by clinicians long before the discovery of the tubercle bacillus, because of the frequent association of lupus with other tuberculous processes. The truth of this view has been demonstrated amply by the evidence found in examples of contagion by accidental inoculation; by the success of experimental inoculation, and by the exciting of reactionary symptoms by tuberculin injections.

The disease process consists of a combination of proliferation and ulceration, granulation and cicatrization, affecting chiefly the corium, in which layer the nodules are formed. The nodules, consisting of cells, which are clustered around the capillaries and lymph channels, show at their periphery layers of small round cells, beneath which is a zone of larger epithelial cells, and in the center are large and well developed giant cells containing homogeneous centers and many peripherally arranged nuclei. These giant cells are more numerous, and the epithelial cells are of greater size, than those found in tubercular areas affecting other regions of the body.

Because the multiplication of the cells in the center of the nodule interferes with the vascular supply, the centers of the nodules degenerate and the nodules themselves undergo coagulation necrosis, followed by fatty degeneration and disintegration, the epidermis becoming so distended and attenuated that it is likely to rupture, in which event it is followed by ulceration.

In the epidermis, also, the rete proliferates and degenerates, and connective tissue forms between the papillæ, so that in a single specimen there may be equally well presented both the advance of the disease and its cicatrization. Similar changes occur in the epithelia of the glands and hair follicles. The presence of the tubercle bacillus is absolutely pathognomonic; it is constantly present, though not numerously; indeed, in some cases it may be found only after prolonged search through many sections. A study of the excised nodules showed that the tumor was tubercular in this case.

The reaction to tuberculin tests is distinctly positive, and notwithstanding the fact that tissue transplanted in animals produces tuberculous nodules, the scarceness of the bacilli in the lupus area is remarkable, although it cannot easily be explained. Nevertheless, it is not improbable that the bacilli are rapidly destroyed, and that morbid reactions result from the products of toxins generated by their destruction. The mode of entrance into the skin, too, is uncertain, although it may be by direct inoculation, or by extension from deeper tuberculous foci, while other cases may arise by transmission through the lymphatics and the circulatory systems, in which instance the idea of maternal inheritance should not be overlooked.

The onset of the disease is marked by an eruption of pinhead sized spots which gradually enlarge and form nodules. After a time this initial eruption is followed by others, and the nodules soon run together and constitute appreciably elevated patches. The area beneath the surface after a time becomes soft and yellowish, and as the disease spreads along the surface it acquires new territory as it spreads, hence the term "lupus," a wolf. The old areas usually then undergo atrophy, or, more seriously it may be, ulceration occurs, which is inevitably followed by cicatrization. The ulcerations follow the course of the lymph channels, and in the spreading of the disease, tissues of all kinds are destroyed, including muscles, cartilage and even bone. The subjects often reach an advanced age, so that one of the most conspicuous clinical features of lupus is its protractedly chronic course, the process exhibiting scarcely the slightest change for weeks or months at a time. In some cases the areas may undergo fatty degeneration and become absorbed without ulceration, and leave only a white, wrinkled and shiny scar. But more frequently the areas break down into indolent ulcers, their flabby borders and unhealthy granular floors, bathed in purulent secretion, are soon covered by dirty yellow crusts, and after a time heal into thin, white glistening cicatrices, only to be followed by the development of firm and fibrous scar tissue. In some cases the healing may be complicated by pus infection, and there is always the likelihood of erysipelatous infection arising also; while in others, epithelioma has been known to have developed in the patch. It must not be overlooked, too, that lupine tubercular infarctions may be transmitted to the bones and joints and to the lungs and the viscera.

Usually the patients are anemic, and commonly present the scrofulous cachexia, but aside from the presence of the ulcers, which may be tender but not at all painful, they complain of but few subjective symptoms.

The lymphatic glands adjacent to the patches may become enlarged and inflamed, especially in cases where the ulceration is marked, and exhibit a tendency to suppuration because of the addition of pyogenic elements; yet adenitis may arise as a part of a general tubercular infection, as well as through the direct transmission of bacilli from the lupus area.

The malady is most commonly situated on the face, electing a predilection for the tip of the nose, while the next common seats are the extremities, especially the forearms and the legs. The surface of this man's nose is deeply pitted, and the ala on the right side has been destroyed. It is usually confined to a single patch, which spreads slowly, requiring often several years before attaining to any size. When foci develop on the general surface, they do so conjointly with or subsequent usually to the facial manifestation, and, conversely, the face may share in the disease when the eruption is noted primarily in other parts.

The mucous membrane of the nose and mouth may become affected and present indolent granulating ulcers which bleed readily.

When lupus of the face has lasted for a long time, it may invade the eyelids and the globes, with disastrous effects, even to the extent of complete blindness; but more commonly when the spreading disease encroaches upon the eye, the cicatricial formations which ensue may only distort the eyelid and produce moderate ectropion; yet in severe cases the ectropion may be so marked as to lead to irreparable damage to the globe.

As has already been surmised, extensive involvement of the face is likely to be accompanied by lupus of the lids, which ensues usually by the migration of the diseased cells from neighboring regions, particularly from the nose and the cheek, or from the lacrimal duct. It is not improbable that because of the frequence with which the nasal and lacrimal regions are affected, many cases of primary infection arise within the nose, for, as has been pointed out, the most commonly involved site is near the outlet of the nares; but careful study of each case must be made before it can be decided whether or not the infection has passed from the conjunctiva to the nose, or from the nose to the conjunctiva. It is not possible to decide where the disease began in this case.

The process may involve the tarsal and meibomian glands without at first causing ulceration; yet, as they commonly become involved in the general process, ulceration invariably ensues and causes great destruction of the skin and underlying tissues, with the consequent disfigurement through the extensive contraction of the scars. In addition to the distortion of the lids, the lacrimal passages may become occluded or even necrosed.

In a like manner by which the lids are affected, the process may pass from the lids over onto their conjunctival surfaces, and extend to the eyeball. The globe itself may be seriously affected at the limbus of the cornea, as that region offers a favorable site for the extensive development of lupus, which by its inroads may endanger the integrity of the eye. Not only can the conjunctiva be invaded by extension from the lacrimal duct, but it may be affected directly or be encroached upon by patches on the face. In these situations it is manifested as ulcerated surfaces, the bottoms of which are covered by granulations, in the substance of which may be found the tubercular bacilli.

Tuberculosis and lupus of the conjunctiva should be regarded as essentially identical affections, according to Fuchs, insofar as both represent processes produced and maintained by the presence of the tubercle bacillus, and by the fact that each is characterized by the formation of ulcers having steep swollen edges surrounding very vascular granulation tissue. Lupus ulcers of the conjunctiva can be distinguished from tuberculous ulcers, however, by remembering that they have migrated from the skin to inside the conjunctiva, and that, like lupus of the skin, they show spontaneous cicatrization on one side, while on the other the ulcer keeps advancing. It is likely that in this man's case the tarsal glands became infected and the nodules were outgrowths from them; the ulcerous surface of the conjunctiva is not so great as has been noted in cases reported by other observers.

Lupus vulgaris must be diagnosed from: (1) Lupus erythematosis, which is a disease of early adult life, and is of quite rapid development, often requiring only a few weeks or months for full development; the patches of which are pinkish and scaly, and tend to surround the follicles. There may be also several plaques, which present only a moderate degree of infiltration, but without ulceration, and are followed by atrophy without leaving a scar; moreover, the tuberculin reaction in lupus erythematosis is negative. (2) The tubercular syphiloderm, which becomes manifest in middle to later life. It may be found upon almost any part of the cutaneous surface, entirely independent of the face. The syphiloderm is rapid in its development, assumes regular shapes, and in its several patches is darker than lupus. In addition, there is usually the history of a definite infection, which supposition can be confirmed by the presence of typical scars as well as by the Wassermann reaction. (3) Epithelioma; but epithelioma is a disease affecting individuals commonly after forty years of age, and usually by a single patch which may have developed on the site of a wart or mole, or have arisen after trauma, and may have rapidly formed into a round ulcer with dense borders which readily bleed. Yet the diagnosis may be difficult, when, as in lupus, there are bordering cicatrices, and it may be still more difficult when, as in a case reported by Capauner, there is an excess of epithelial new growth.

The finding of the tubercle bacilli will, of course, remove all doubt as to the nature of the case. There are no constitutional symptoms in lupus, as has been stated, unless there be those which arise from an associated internal or pulmonary tuberculosis. The ulcers are not painful, and their presence gives rise to but little trouble beyond the disfigurement they produce. Enlarged, swollen, inflamed and caseating glands may result in some cases, and eventually a general tubercular infection may ensue. While it may be true that lupus, as a form of tuberculosis, may arise primarily in the conjunctiva, it is usually secondary to other foci; yet in this connection it is well to bear in mind that lupus of the conjunctiva may be the only tubercular affection manifested in the individual. This case presents adenitis about the jaw on the left side, with sinus tracks extending far up into the side of the face. Because of the patient's entire freedom from pulmonary tuberculosis, and the absence of visible disease of the osseous system, it may be accepted that his present affection is truly local.

The course of lupus is essentialy chronic and slow, with scarcely any perceptible sign of its progress, yet, notwithstanding, its path gradually extends and exhibits no tendency to disappear. The prognosis, therefore, should be guarded. The disease is usually rebellious to treatment, and relapses are not uncommon, particularly when the treatment has been intermittent or insufficiently radical. In America, as a rule, lupus is less violent and less progressive, and yields more readily to therapeutic measures than has been the case in the countries where the disease is common.

The ophthalmologist should confer with the dermatologist in his management of any case of lupus involving the ocular structures.

The treatment of lupus should have regard for both the general health of the individual and the local manifestations of the disease, because this malady is distinctly one wherein the effects of the two conditions are interactive. Therefore, to attain any improvement, every effort should be made to improve the general health of the individual by attention to the diet, and increase the absorption of fats, as by the administration internally, as well as by inunctions, of cod liver and other oils. The guarded but long continued use of the mercurials, for the alterative effect obtainable from the use of that metal, alone, as by inunctions, or in the form of the gray powder; or combined with iron and quinin (one or two grains of the sulphate to ten drops of the tincture of the chlorid), alternated with strychnin. Fresh air, obtained best, perhaps, by the removal of the child to another locality, preferably by a sojourn in an outdoor hospital; and by immunization by the graduated inoculation with tuberculin vaccins. Thus in every way seeking to raise the resistance of the individual against the invading organism.

In the use of tuberculin, new or old, certain guiding principles should be adopted. As much as 0.5 milligram to even greater doses may be given, although usually just sufficient to produce reddening of the tissues, but only that quantity which shall cause a slight general reaction, which should not exceed one degree Fahrenheit. Small, nonirritating doses may then be continued at intervals of two days, while larger doses can be given after longer intervals. The adjustment of the time can be so arranged as to allow for the subsidence of the reactions occasioned by such dosage.

In situations where it would be inexpedient to attempt such radical measures as the excision of the surface, local applications may consist of the use of pastes of pyrogallol, although its use is quite painful; arsenic ointment, of strengths graduated to the extent of the surface to be treated, followed by the use of boric acid salve. Whenever possible the lupus area should be removed without delay, either by excising well out into sound tissue, or scraping it with a sharp curette and then dusting with iodoform, or by destroying the ulcerated surface by searing it with the actual or the galvanocautery, as well as by the high frequency current. All of these measures are among the most efficient methods of treatment. But when the surface was more or less dry, Finsen light, in the inventor's hands, yielded good results. X-ray emanations, applied for from ten to twenty minutes, according to the power and softness of the tube, may effect a cure.

When the disease invades the mucous membrane of the eye, the treatment consists in the radical excision or curettement of the ulceration, and the cauterization of the raw surface, great care being taken not to damage the cornea. When the area is so extensive that complete removal would likely be followed by symblepharon or other deformity, we may have to rely solely upon the use of tuberculin. The after-treatment should consist in the long continued use of powdered iodoform, which for many years has been regarded as of special value in tuberculous processes.

XVIII.

A CASE OF LUPUS OF CONJUNCTIVA AND CORNEA.*

C. E. G. SHANNON, M. D., AND L. W. HUGHES, M. D.,

PHILADELPHIA.

K. S., male, colored, aged twenty-two years, unmarried. Admitted to the eye ward of the Philadelphia Hospital, September 1, 1914.

Family History.—Father living and well. Mother, one brother and one sister died of tuberculosis at the ages of thirty-eight, twenty-seven and twenty-eight years, respectively. An aunt also died of the same disease.

Personal History.—Up to the age of eighteen years his general health had been good. In August, 1910, he noticed a papular elevation just below the nose, followed by other papules until the upper lip and nasolabial folds on each side were involved. The affection was correctly diagnosed as lupus vulgaris, and had healed under treatment, followed by rather extensive scarring. Coincident with the dermal infection the glands of the neck became enlarged and suppurated and was continued up to the present time.

History of Present Illness.—In August of 1914 a small papule appeared on the lower lid near the outer canthus of the left eye, for which treatment was given with satisfactory results. Four weeks later, while at work, he received some powdered slack lime in his eyes, causing considerable inflammation. Examination a few days later revealed a red mass beneath the upper lid of left eye, about twice the size of a pinhead. The mass increased in size, and at the time of his admission to the hospital was about as large as a small walnut. It was polypoid in form, granular in appearance, and was attached to the tarsal conjunctiva by a short thick pedicle. The surrounding conjunctiva was the seat of an abundance of papillary growths. A mucopurulent secretion bathed the entire conjunctival surface. The cornea became ulcerated by extension of the lupus to that structure, and ultimately ruptured, producing an extensive leucoma adherens. The growth was removed by Dr. Hansell on October 4, 1914, and Dr. Rosenberger reported that the tumor was a tuberculoma.

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*Read before the Section on Ophthalmology, College of Physicians, Philadelphia, December 21, 1916.

Recent examination of the left eye shows a swollen upper lid, causing ptosis. On eversion there is a decided excavation at the site of the tuberculoma, while the adjacent tissues show numerous papillary swellings. The von Pirquet was positive. Wassermann negative. There were no signs of tuberculosis in other organs of the body.

XIX.

PRESSURE CHANGES IN THE CURVATURE OF THE CORNEA, DUE TO CHALAZION AND OTHER LID TUMORS.*

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At various times our literature has contained articles in which someone had attempted to change the refraction of eyes by some form of massage or manipulation through the eyelids. These efforts have usually not been sufficiently convincing to justify us in following them, for whilst we know that the external coats of the eyeball ordinarily yield somewhat on pressure, and that for every 0.3 millimeter of change in the anteroposterior diameter, the refraction is altered by one diopter, we also know that when this pressure is removed the eyeball will resume its natural shape and the same state of refraction as existed before the pressure was applied.

It has been shown that by putting the fingers over the external canthus and pulling the eyelids outwards the distant vision of low myopia may be improved. This was demonstrated by Mr. E. Donaldson,[1] who also called attention to the fact that this method of stretching the eyelids by the fingers improved the vision in astigmatism against the rule, whether hypermetropic or myopic, and explained that this improvement is due to flattening the cornea in the horizontal meridian.

It has been known for years that persons with eyelids of certain shapes are likely to have definite forms of astigmatism, leading us to conclude that the constant direction of pressure may be a factor in modifying the curvature of the cornea. That chalazion or other lid tumors may by their pressure modify an existing astigmatism or other error of refraction has

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not been noticed in our literature, so far as I am able to learn, except in a note by Henry Dickson Bruns[2] in 1905. Although Oliver[3] does say rather vaguely, I think, "that direct and indirect pressure on the cornea or the sclerotic, as for example, from new growths that are situated either in the orbit or in the eyelids, are said to give rise to corneal astigmatism."

In 1904 a patient of mine came complaining of poor vision in one eye. Examination revealed a chalazion upon the right upper lid, which he declined to have removed. He had been wearing + .50 cyl., ax. 180°, over each eye, but now the right eye accepted — .50 cyl., ax. 15°. The axis was confirmed by the ophthalmometer, but his vision, whilst 6/6, was not so clearly defined as in the other eye. One month later this patient had the chalazion removed, and shortly thereafter he again complained that his glasses did not give satisfaction, when examination showed that his refractive error in the right eye was again corrected by + .50 cyl., ax. 180°. The left eye had remained unchanged.

In May of this year a clergyman, aged fifty-one years, who had been a patient of mine for about ten years, came for refraction. He had a large chalazion on the right upper lid. His refraction was: Right eye, + .25 ⊃ + .50 cyl., ax. 130°; left eye, +.75 ⊃ + 1.25 cyl., ax. 50°. This impressed me at the time, for the manifest hyperopia had been the same in each eye during the years I had had him under observation. I examined his eyes daily for three days, always obtaining the same result. At this time I obtained his consent to remove the chalazion. One week later his refraction was: Right eye, + .75 sp. ⊃ + .50 cyl., ax. 130°; left eye, + .75 sp. ⊃ + 1.25 cyl., ax. 50°, showing the manifest hyperopia to be the same in each eye as it had been during previous years.

Dr. Bruns' observations were upon himself, and are so complete that I will quote them in full:

"In 1887 the refraction of the writer, then twenty-two years of age, was most carefully measured under repeated instillations of homatropin, by Dr. Howard F. Hansell, of Philadelphia; it was found to be: Right eye, + .50 ⊃ + .50 cyl., ax. 90°; left eye, + .25 sp. ⊃ + .50 cyl., ax. 90°. Vision was 20/15 with each eye, and has always so remained. April 8, 1899, the astigmatism, measured with the J. S. ophthalmometer, was found to be: Right eye, .50 cyl., ax. 105°; February 3, 1901, the same instrument gave an identical reading. In May, 1904, a small chalazion, about three or four millimeters in diameter, developed, with moderate inflammation, in the upper lid of the right eye. At the same time the vision of this eye became uncomfortably dim at all distances. Right eye vision 20/30, the outlines not clear cut, and while Sn. No. 4 could be read with the presbyopic correction, + 1.75 sp. ⌢⌣ + .50 cyl., ax. 90°, the print looked smeared, and not as it appeared through the same glass with the left eye. Now, on May 27, 1904, very careful measurement with the ophthalmometer showed: Right eye, 0.; left eye, .50, ax. 105°; and right eye, + .50 ⌢⌣ + .50 cyl., ax. 165° = 20/20. This condition lasted a month or two, when the chalazion began to disappear, and gradually, very gradually, the vision for near became clear and comfortable with the old correction, and vision in right eye was 20/15. Today (April, 1905) the ophthalmometer shows in right eye 50 ax. 90° once more."

An interesting feature in the three cases reported is that the hyperopia or hyperopic astigmatism was diminished, showing that it was a modification of the corneal curvature and not a shortening of the eyeball in the anteroposterior diameter, for if it had been the latter, the hyperopic condition would have been increased.

In conclusion, I believe that these three cases prove conclusively that these neoplasms may cause changes in refraction that will subside with the removal of the tumor, and that in prescribing lenses for patients suffering with these conditions it is well to bear this in mind and so tell the patient; especially is this true when it is under these circumstances that we first prescribe lenses.

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2. Bruns, H. D.: The Ophthalmic Record, Vol. 14, p. 421.
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XX.

REPORT OF A CASE OF ORBITAL ABSCESS WITHIN THE MUSCLE CONE.*

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Orbital cellulitis is an exceedingly grave condition, whose termination may be loss of life by extension to the intracranial structures. According to Birch-Hirschfeld, seventeen per cent of cases resulted in death from meningitis, brain abscess or thrombosis of the cavernous sinus. Blindness results in twenty per cent of those cases whose termination has not been fatal.

The orbit is a closed cavity, but is in intimate relation to the nasal accessory sinuses, and its veins, the superior and inferior ophthalmic, have intimate connection with the veins of those cavities, besides draining the lids, eyeball, etc. Roemer says: "Investigations have shown that the anatomic nature of orbital cellulitis is that of a thrombophlebitis," and he further states: "Cellulitis is easily differentiated from a retrobulbar tumor by its sudden commencement and the grave inflammatory symptoms."

This condition may be caused by direct infection, as from trauma, metastasis from a distant focus of infection, but far the most frequent cause is infection from one of the adjacent nasal accessory sinuses. This infection may take place by way of the veins or lymphatics, or as a result of a necrosis or dehiscence of the bony wall of the orbit allowing entrance of the infecting material into the orbital cavity.

***Read at the meeting of the Medical Society of Virginia, Norfolk, Virginia, October, 1916.**

Birch-Hirschfeld examined 684 cases of orbital disease, periostitis, subperiosteal abscess, edema, cellulitis, paresis of the ocular muscles and optic nerve disorders, and of these, 409, or sixty per cent, were found to be due to inflammation of the neighboring sinuses. In commenting on these statistics he says that this is the known percentage, and if the actual cause of the remaining forty per cent could have been determined, he is convinced that the percentage caused by sinus disease would have been much greater than sixty per cent.

CASE REPORT.

Mrs. V. B., white, married, aged thirty years; no children, no miscarriages or abortions, nothing significant in personal or family history prior to history as given.

She was referred by Dr. G. B. Martin, who furnished the following history:

First seen in June, 1915, complaining of a small abscess over the sternum. This was incised, and after the pus was evacuated, lesion healed without further treatment.

Was called again November 12, 1915. At this time patient was suffering with a carbuncle, situated a little to the right of the spine, opposite the middle of the right scapula. Same was incised, curetted and swabbed out with pure carbolic acid. Daily dressings were done, and a quantity of pus evacuated each time.

On November 15th, staphylococcic vaccin combined, consisting of aureus, albus and citreus, of each five hundred million, was administered and continued on alternate days for four doses. After the third dose the carbuncle ceased to discharge pus and began to heal very kindly.

On November 19th, patient's left eyelid was swollen when she arose in the morning, and by the next day eyeball was bulging noticeably. She was also complaining of severe pain in the orbit, together with nausea and vomiting.

Local applications seemed to do very little good, and it became necessary to resort to opiates to relieve the pain.

Urinalysis.—Dark amber, clear, acid; specific gravity, 1025. Albumin negative; sugar, positive; urates, positive +. Microscopic examination, negative.

November 24th patient was first seen by me, and in addition to the above history, given by Dr. Martin, patient said she had noticed first orbital pain after initial dose of vaccin, but this had subsided only to become more marked with each succeeding dose, and she was inclined to blame the vaccins for her suffering, but was assured that they were not responsible. Examination revealed slight edema of left upper eyelid with retarded elevation, injection of ocular conjunctiva, exophthalmos not now apparent, ocular movements good in all directions.

Ophthalmoscopic examination showed a normal fundus. No elevation of temperature, no nausea or vomiting. Anorexia with constipation. Deep pain in orbit, worse when lying down. A purgative was given, together with hot applications locally, and some drops containing a small amount of cocain. Sodium bromid was given every four hours, and for three days she expressed herself as feeling somewhat better, though there was no change in the local appearance of the eye and eyelid. A nasal examination showed nothing suspicious in the nose except a slight turgescence of the middle turbinate. Shrinking of the mucous membrane with cocain and adrenalin, followed by the use of suction, gave no appearance of pus or mucopus.

There was little or no change in the appearance of the eye or feeling of the patient until December 3rd, when the eyelid was found to be more swollen, the conjunctiva more injected. and exophthalmos to a noticeable degree. At this time a blood count was made which showed a leucocytosis with increase in the polynuclear percentage.

December 6th, X-ray examination revealed no pus in the orbit.

December 7th, exophthalmos was markedly increased, edema of conjunctiva, almost total loss of movement in the eye, and inability to elevate lid. Pain great, temperature normal. Leucocytosis slightly more than at previous examination. Dr. John Dunn, who saw the case with me at this time, was inclined to a diagnosis of neoplasm of the orbit, on account of the comparatively slow development and absence of temperature. My own diagnosis of abscess was based on the increasing leucocytosis with no evidence of pus elsewhere. While not fully agreed as to the condition present, we concurred in advising operation, which was accepted.

December 9th, under ether anesthesia, operation was performed at Stuart Circle Hospital. Eye was found bulging forward in central position, with no apparent pointing of abscess at any part of the tissue surrounding the globe. Eye immovable but not deflected away from central position. Incisions through conjunctiva were made internal, external, above and below the eye, and all four walls of the orbit were carefully examined for dehiscences or denuded bony areas, and frontal sinus was opened, but at no point was any pus revealed.

December 10th, all pain relieved by operation. Temperature, 99° F.; pulse, 76 to 86 during day. Exophthalmos and absence of motility of eye unchanged. Urinalysis, specific gravity 1010. Albumin evidently due to ether, as it cleared up by December 15th and did not reappear, nor was sugar found in urine subsequent to Dr. Martin's examination. Blood count, 15,800 whites; eighty-six per cent polynuclears.

December 12th, blood count, 18,600 whites; seventy-two per cent polynuclears.

Repeated ophthalmoscopic examinations showed no fundus changes beyond slightly increased fullness of the vessels. Vision good, but entirely obscured by drooping of lid over the eye. Diplopia present when lid is elevated and right eye rotated from middle line.

December 13th, temperature, 100.2° F., which was the highest point reached at any time. Pulse, 68; respiration, 24.

December 15th, report that there was no change in appearance of eye. She was ordered to operating room to have Kronlein operation performed, for the purpose of exploring the entire orbital fossa. Upon removal of dressings over the eye, after anesthesia was complete, they were found saturated with pus. Search for the point of exit of the pus showed it above the eyeball, just about on a line with the attachment of the superior rectus and immediately internal to this point. Exploration of the abscess cavity with a probe showed it to be unmistakably in the muscle cone. It was deemed wise to explore the maxillary antrum at this time, in further search for the cause of the trouble. The antrum was opened intranasally below the inferior turbinate, and a large mass of mucopus was washed from it. She had never had any symptoms referable to the antrum. From this point recovery was uneventful. Vision remained normal, motility of the eye entirely restored, and no further annoyance from diplopia.

A critical review of this case history leads me to the following conclusions regarding some of its features:

First.—She was possibly affected with a mild character of diabetes with intermittent glycosuria.

Second.—The antrum was the primary focus, which was the source of infection of the abscess over the sternum and the carbuncle on the back during one of her attacks of glycosuria.

Third.—The orbital abscess had as its initial stage a thrombophlebitis from the antral infection. This condition must have been in an early stage when the vaccins were first administered, and as a result of their administration a local reaction occurred which was sufficient to cause increased swelling and pain, but not enough to cure the local infection.

Fourth.—The increased resistance to bacterial invasion produced by the vaccins is probably the reason of the mildness of the systemic symptoms and the very slow development of local symptoms in a condition which is practically always marked by rapid development of local symptoms. Why the optic nerve, surrounded as it was by pus under pressure in the muscle cone, escaped injury is difficult to say. A possible explanation of this may be attributed to the action of the vaccins. It was healthy, normally resistant tissue of an entirely different type from the infected tissue, and the vaccins gave sufficient added resistance to prevent its being infected by the contiguous abscess.

In spite of repeated ophthalmoscopic examinations, at no time could the sign of Uszynski (indentation of the eyeball from pressure) be made out, though its presence might have been expected, as the pressure was marked and long continued.

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XXI.

AN UNUSUALLY LONG OPEN WOUND AFTER CATARACT EXTRACTION.

EDWARD J. BERNSTEIN, M. D., F. A. C. S.,

DETROIT.

On September 18th of this year I was consulted by Mr. H. S. B., of Washington, D. C., aged eighty-seven years, a banker by occupation, for cataract extraction. He had double immature nuclear cataracts. Right eye, counts fingers at two and one-half meters; left eye, counts fingers at two meters. Periphery of lens transparent and fairly good view of fundus obtained, with no lesion to be seen. His physical condition was all that could be desired—heart, kidneys and lungs, blood pressure normal. As in my experience as an oculist, namely, since 1891—under the instructions of Fuchs and the rest of the Viennese school—immaturity of cataract has been no bar to operation, the practice being to operate as soon as the patient is deterred from his usual occupation, I offered to perform the operation, selecting his worst eye (the left one). Accordingly, under cocain, four per cent solution, instilled at intervals of two minutes for three or four applications, I did a conjunctival flap operation, making a large section in the limbus. The lens was never more easily delivered and with less traumatism. A small quantity of cortical matter was readily removed by stroking the cornea with the rubber spoon, and when finished I felt that I had never done an easier operation and was perfectly satisfied with the clear dark pupil and perfect reposition of the angles of the iris. The eye was dressed in the usual manner, a wire cage being placed over the operated eye, and the gauze applied with no pressure on the other eye. He rested very comfortably all day, but orders were given for a hypodermic of one-eighth grain morphin for the night, so that he might be assured a comfortable night's sleep.

The next morning's visit found that he had a most comfortable night, with no discomfort in either eye. Being a very large man and aged, I permitted him to lie upon the right side (unoperated side), with a pillow for support under his chest. There being no indication for disturbing him, the eyes were not uncovered, it being my practice not to touch the operated eye for the first four days unless some cause demands it.

On the third day, notwithstanding the patient had made no complaint, I thought I had better look, and then found the left under lid had completely inverted on itself, forming a wedge, causing the wound to gape widely, and some prolapse of the iris and a small knob of vitreous also presented. Upon replacing the under lid the prolapse at once disappeared, and after putting some (1 to 3000) bichlorid ointment in the eye and fastening down the lower lid with adhesive strip to the cheek, the eye was redressed.

At the afternoon visit there was some tearing from the operated eye, but no pain; in fact, at no time during the whole period this patient was under my care, did he have the slightest pain or discomfort in the eye. Occasionally he was given veronal in five grain dose once a night, to assure sleep, as he had for several years been accustomed to do when sleepless.

To make a long story short, the iris would at times prolapse and at times seemingly be replaced, but the wound would not heal. After the tenth day I placed him on the table to do an operation for the hernia of the iris, but when the speculum was introduced the iris again slipped back in place, and I dared not go after it. This see-saw game kept up till finally, one month after the original operation, I decided to make a flap from the bulbar conjunctiva on each side of the wound and stitch these flaps over the wound, to aid the healing and prevent further prolapse. This last procedure was fairly successful, in that prolapse was prevented, but the corneal wound never did heal satisfactorily, and I had to let him return to his home, after more than two months' care, still unhealed.

He was to see Dr. Robert Randolph of Baltimore in two weeks after he got back home, unless something occurred to make him go earlier. A letter from Dr. Randolph, dated November 18th, stated that the wound had not even at that date entirely healed, that he had considerable iridocyclitic membrane which occluded the pupillary area, and vision was only light perception.

The singular thing about this case was the fact that he had an open wound all this time and no septic condition, and never once complained of a moment's pain or discomfort.

It should be noted that when the conjunctival flap operation was performed, I did a Gaillard-Arlt operation on the lower lid and permanently cured the entropion.

As the corneal wound usually heals in three or four days at most (the longest time I ever knew to elapse was seventeen days, in the practice of one of my friends), it seems that this most unusual case is worthy of record.

XXII.

A SUGGESTION FOR AN IMPROVED PROTHESIS.

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In the last two years the contributor of "A Suggestion for an Improved Prothesis" has not been so well pleased with the artificial eye as has many of his confrères, and, with a desire for improvement of the prothesis, has investigated some of its shortcomings.

Casey Wood, in the "American Encyclopedia of Ophthalmology," says: "With a large supply, both of the irregular ovoid reform prothesis, as well as the older shell plates to choose from, not to speak of the possibility of securing the service of a competent artist to make and adjust every unusual form socket, no patient can complain that he cannot have a satisfactory companion for his remaining eye."

The above expression of the editor of this popular ophthalmic encyclopedia would leave us with the belief that we have reached an ideal; yet repeated observation of the patients convinces us that a more perfect cosmetic appearance may be obtained.

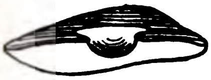
Previous contributions of the writer: "The Enucleation and Evisceration Are Faulty Technics"[1] and "Injury of the Sympathetic in Enucleation"[2] will offer some of the explanations for these desired improvements. Probably there is ambition to imitate nature too keenly, and even at best we are far distant; yet if this humble suggestion should prove a stimulus to a practical appliance which may be adopted advantageously, then the writer feels his efforts have been rewarded. With hesitancy I suggest the following, which may possess certain possibilities and may stimulate thought to an improvement.

This suggested modification has found in my hands a degree of satisfaction, but a finished product will prove much superior, and it is the wish that others try it to the assistance of a development. There are practically but two accepted prothesis adopted by the ophthalmic surgeon, one the ordinary artificial eye, and the other the Snellen eye, better known as the improved eye. Both are made of glass, and it is doubtful if glass can be improved upon in its construction. Many substitute materials have been used, but have not met with any great success. Grossman advised an improvement on the prothesis; he desired to overcome that sinking in of the upper lid at the superior tarsal ridge, and used an elevation of wax upon the upper part of the artificial eye, and subsequently had it made in glass. It does not seem to have met with favor, and though it may correct this fault, it did not aim to eliminate the cause of the sinking in of the upper lid, and with improved method of enucleation it would serve in but a few cases.

The suggested improvement submitted in this contribution has been principally adopted from the plate used by dentists to which the teeth are attached. This plate of hard rubber is properly fitted to the roof of the mouth, the superior surface of the plate has a concavity which is to produce a degree of suction during the time of swallowing, and the plate is held in position.

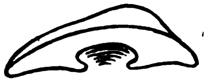
The diagrams here submitted will show the suggestions for this eye improvement. First an artificial eye made of glass is used, the different shapes and contours being just as in the improved eye of Snellen, but on the posterior surface there is an opening about four to twelve millimeters in size. This opening is finished within as shown by diagrams 1, 2 and 3, and should be free from any sharp edges. The aim is to produce a moderate suction through the vacuum occasioned during the working of the lids. Rough edges are to be avoided, so as not to injure tissues. In a properly adjusted eye, correct size and shape, and chiefly when it is used, following one of the more recent ideas of procuring a more acceptable stump, it will grasp nicely the tissues and procure an effect much to be desired. Time has not convinced me that the tissues may not be injured by this slight suction, and a conjunctivitis may be the consequence. I admit all these possibilities, but in my limited experience such is not the case. In certain larger centers, where the prothesis may be properly blown by a competent artist, it is thought better results are to be obtained.

DIAGRAM I



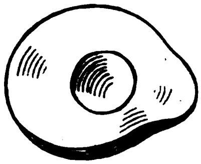
Section showing lined opening and undercut in posterior surface.

DIAGRAM II



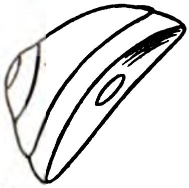
Another section showing opening and undercut.

DIAGRAM III



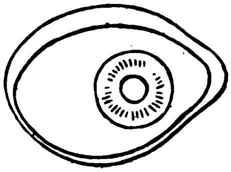
Posterior surface showing depression.

DIAGRAM IV



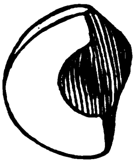
Rubber cap over posterior surface of Snellen eye.

DIAGRAM V



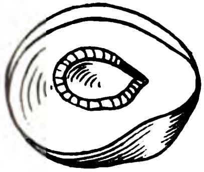
Anterior surface.

DIAGRAM VI



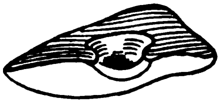
Section.

DIAGRAM VII



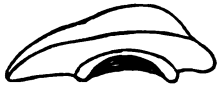
Posterior section showing elevation and depth.

DIAGRAM VIII



Section showing elevation, undercut and depth.

DIAGRAM IX



Section showing elevation and depth.

Another suggestion in the development of a prothesis, and differing from the above slightly, and possibly possessing the same advantages, has on the concave posterior surface of the Snellen eye an elevation, as of a dam around a concavity. Shown in diagrams 7, 8 and 9.

And still another plan suggested, which has met with a degree of dissatisfaction, is to use a rubber cap on the posterior surface of the Snellen eye. This rubber cap was procured from the top of a serum container, and used over the posterior surface of the plate. As shown in the diagrams 4, 5 and 6, a small hole is made in the rubber cap. This will cause a suction and hold the prothesis very nicely.

I fear, with my limited experience, that the suction in the last one is greater than desired, and the fitting of the cap to the prothesis produces too much irritation when in the orbit, and someone will have to suggest a better adaptation for the rubber cap. These caps are inexpensive, easily removed and new ones procured. The point of great objection is where the cap fits over the glass shell.

I submit this humble idea for what it is worth, and would ask others to try it and see if a superior prothesis is not to be obtained.

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XXIII.

TUBERCULOSIS OF THE RETINAL VESSELS WITH RECURRING HEMORRHAGES AND PROLIFERATING RETINITIS.

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It has not been very many years since ophthalmologists considered the eye comparatively free from tuberculous invasion, but the more we recognize the etiology of disease, the more we are forced to admit the manifold manifestations of tuberculosis in all organs of the body. A sufficient number of cases of tuberculosis of the retinal vessels have been reported to date to make this a definite disease in our classification of tuberculosis of the ocular structures, as each and every part of the eye is subject to tuberculosis in one manifestation or another. The remarkable thing is that the eye is not involved oftener than it is, especially in people who suffer from pulmonary tuberculosis for a period of years, or who die from the malady without any of the ocular structures being invaded at any time during the course of the disease.

Hemorrhage, with or without reduction of vision, depending upon the part of the retina involved, is often the first evidence of retinal invasion. The hemorrhages are almost always multiple, and may be only pin point in size or so massive that they seem to fill the entire vitreous chamber. In young adults there may be no other evidence of tuberculosis. It may be important to inquire if the patient is in the habit of drinking milk, as Finnoff[85] has mentioned. Such patients often "look the picture of health," and, in fact, a very careful physical examination by a competent internist may fail to reveal any demonstrable evidence of tuberculosis in other organs of the body—i. e., in the lungs and lymph glands. However, they may give a general, a local, or even a focal reaction to human or bovine tuberculin.

Later in the course of the disease the retinal vessels show slight perivascular thickenings, or if the process is carried far enough, extensive fibroid changes take place about the vessels. In other cases fibrous bands form, so that the condition known as proliferating retinitis is present.

Noll,[1] in 1908, mentioned the fact that hemorrhage from the retinal vessels into the vitreous chamber is due to tuberculosis of the vessels. However, he ascribed the primary focus of infection to the ciliary body and choroid; and, if we may judge from some of the cases, he is undoubtedly correct, as the invasion of the retina is often secondary to that of the ciliary body and choroid.

"Form of Retinal Tuberculosis" is a second article on this subject by Arnold Knapp.[2] In speaking of the juvenile vascular disease and exudative retinitis, he intimates that tuberculous disease of the retina is the underlying cause. He reported two cases with distinctly retinal lesions, vitreous haze, and superficial disturbance of the choroid. The tuberculin test gave general and local reactions, but he does not say whether or not there was a focal reaction. Under treatment with tuberculin the lesions at first extended, then gradually disappeared, but left serious impairment of central vision.

Agricola and Thies[3] have reported histologically upon an eye enucleated following cerebral symptoms. This eye had suffered from serious tuberculous keratitis and iritis which had healed under tuberculin treatment but left the eye blind. They found a chronic tuberculosis of the ciliary body with only slight involvement of the choroid. The involvement of the retina seemed to be secondary to that of the ciliary body and choroid. Tissue resembling proliferating retinitis was found near the disc. There were perivascular tubercles about the retinal vessels.

In this case the early involvement of the cornea, iris and ciliary body doubtless prevented ophthalmoscopic examinations even early; so the disease of the retina was not recognized until after the eye had been enucleated and the histologic examination made. Even had the tuberculosis of the retina been primary in this case, it would have been very difficult or impossible to discover this clinically. Hemorrhage coming from the retinal vessels in elderly adults would not necessarily arouse our suspicions concerning tuberculosis of the vessels, but in young adults this cause should be seriously considered in each and eyery case.

Stock[6] made a histologic examination of one eye of a patient, following death from miliary tuberculosis. This patient suffered obscure symptoms prior to his admission to the hospital. Eight days after admission the obscure retinal hemorrhages in both eyes were ascribed to general sepsis. However, three miliary tubercles were found in the left choroid on the day of his death. Histologic examination revealed hemorrhages in the nerve fiber and ganglion cell layers of the retina. No tubercle bacilli were found in the retina, but the hemorrhage appeared to be due to general tuberculous infection.

Cords[4] has reported two cases which improved under tuberculin treatment. He also collected from the literature six other cases which were probably undoubted tuberculosis of the retinal vessels.

Igersheimer[5] examined three cases of tuberculosis of the retina, and two of these cases had pulmonary tuberculosis, just as the author's[36] second case had.

Gilbert[7] has reported three cases of periphlebitis, in each of which the tuberculin reaction was positive. He thinks these cases show that the tuberculous disease of the anterior segment of the uvea may cause phlebitis of both the uveal vessels and the central retinal vein.

Fleischer[8] has reported a case of retinal periphlebitis and pulmonary tuberculosis in a man of thirty-six years. The age of this patient corresponds very closely with that of the author's[36] first case. This case showed extensive hemorrhages with periphlebitis. The hemorrhages were absorbed with return of vision. A year later there was iritis followed by a secondary glaucoma, for which the eye had to be enucleated. Tuberculous débris was found in some of the dilated veins.

In one of Harms'[9] cases the patient had tachycardia upon slight exertion, and responded to tuberculin with a weak positive reaction. This patient had retinal hemorrhages with periphlebitis, and, while there was gradual improvement after a few weeks, some of the lesions remained, even though the vision rose to normal.

Oloff[10] has also reported two cases of tuberculosis of the retinal vein. Both of his cases gave a distinct general reaction to tuberculin, but he does not say whether or not there was a local and focal reaction. Both of his cases were young men and stout robust sailors. He states these cases were not benefited by tuberculin treatment, but he believes they do best under general dietetic and hygienic measures.

In only one of the five cases of retinitis with massive exudation was there marked tuberculin reaction in the cases reported by Friedenwald.[11]

Otori[12] has given quite a detailed report upon retinal tuberculosis, and reports two cases seen clinically. He also gives detailed experiments upon rabbits concerning ocular tuberculosis. His first case showed extensive hemorrhagic inflammation of the iris and cornea, for which the eye was enucleated. Histologically, the retina was found to be extensively destroyed, the nasal portion being entirely necrosed, and a number of typical tubercles being present. Tubercle bacilli were demonstrated. This is the first case of primary retinal tuberculosis in which tubercle bacilli have been found in the tissue. He used a modified staining method to demonstrate these.

In his second case there was a severe plastic iritis followed by secondary hemorrhagic glaucoma, for which the eye had to be enucleated. The anterior half of the nasal side of the retina was found to be necrosed, and tubercle bacilli were found in every part of the retina. The tubercle bacilli were numerous on the optic nerve head, and some appeared in the posterior part of the ciliary body.

Six or seven years ago Axenfeld and Stock[13] expressed the opinion that hemorrhage from the retinal vessels in young adults is almost always due to tuberculosis of the retinal vessels. At least this etiology should be excluded in arriving at the diagnosis. In considering the etiology of such cases, one should exclude arteriosclerosis, syphilis, hemophilia, cardiovascular diseases in general, thrombosis or embolism of the central artery or vein, nephritis, etc. One should always be on the alert for changes due to syphilis, and this disease should be excluded in all cases of retinal hemorrhage. It is very easy to make the error of considering all cases of hemorrhage into the vitreous as luetic and treating them with mercury and potassium iodid, when such cases should receive injections of tuberculin. We should by all means consider hemorrhage into the vitreous just as characteristic of tuberculosis as hemorrhage from the lungs in the pulmonary form of the disease. Certainly, the majority of these cases show rather extensive hemorrhages into the vitreous; often these are even massive. A few cases have had very small hemorrhages confined to the retina. In the two cases reported by Knapp,[14] hemorrhage from the retinal vessels into the vitreous was a very prominent symptom.

Sydney Stephenson[15] first described a chronic form of choroidal tubercle, or "obsolescent tubercle," in strumous children. He considered this as tuberculous. These cases have been definitely determined to be tuberculous by the diagnostic use of tuberculin. If only one eye is involved with this disease, there may be repeated hemorrhages before the patient becomes aware of the loss of vision. This was true in the author's[36] first case.

Fuchs,[16] in the last English edition of his book, intimates that thrombosis of the central vein is probably the etiologic factor in hemorrhages into the vitreous.

De Schweinitz[17] refers to Dimmer's classification, but mentions tuberculosis as one of the many causes of retinal hemorrhage. Roemer[18] mentions the fact that tuberculosis may be present in a patient with retinal hemorrhages without being the cause.

One striking feature of the disease is the fact that such cases rarely show other evidences of tuberculosis, even after a careful and thorough physical examination. It is, therefore, necessary to make a tuberculin test, as Posey[19] has mentioned, before the diagnosis can be made. The second case which I have had under observation during the past year is an exception to this rule. There may be deep seated tuberculous glands somewhere in the body or one or more very large or very small tuberculous foci deep in the lungs.

Gamble[20] has mentioned the fact that the intraocular tuberculosis is endogenous in its origin, and is only one of the tuberculous foci within the body.

On the other hand, F. H. Verhoeff[34] believes that tuberculosis of the retina is secondary to that of the ciliary body and choroid. He believes these cases are due to infection with bovine bacilli as a result of drinking milk. However, a careful physical examination often fails to reveal any focus of infection in the body. However, an isolated tubercle may rupture into a blood vessel and produce by metastasis infection of the retinal vessels. At the present time, at least, this is the most logical explanation that can be given for these cases. The focal reaction to tuberculin is the most positive means of diagnosis, but most of the cases will give only a local and a general reaction. We know that a mild local or general reaction in adults is of very little importance, because so many adults will react to tuberculin. Ninety per cent of the adult population of Vienna will react to tuberculin.

In health resort regions, especially in Colorado, a positive history of tuberculosis is very difficult to obtain, except in the last stages of the disease, as Jackson[21 22 23] has mentioned. For this as well as for other reasons, already mentioned, patients with recurrent hemorrhages from the retinal vessels should receive very thorough examinations from ophthalmologists, internists, etc., because so much depends upon a proper diagnosis made early. While we know that vitreous hemorrhages tend to be absorbed and the vision restored, this is not true when the retina becomes destroyed by proliferation. In fact, one of the most pronounced late symptoms of the disease is the vasculitis and perivasculitis with fibrosis about the vessels. The fibroid changes undoubtedly occur subsequent to the hemorrhages, although both go "hand in hand" in any given case, and both lead ultimately to the condition known as proliferating retinitis.

Mayou[24] has reported a case in which the fundus presented an appearance not unlike albuminuric retinitis with exudates. He believes the infection may gain entrance to the retina along the optic nerve sheath, and he reports this case to illustrate his point.

Parsons[25] has the following to say: "Transmission by the lymph stream is probably the commonest mode of infection, so that the sheaths suffer most frequently and worst."

Under the name of retinitis proliferans, Manz[26] has described an affection in which dense masses of connective tissue extend out from the retina into the vitreous and cover a portion of the fundus—in fact, even the papilla itself. Into these masses run new formed vessels from the retina. For a number of these cases, it is probable that these masses of connective tissue have been preceded by hemorrhages which were poured out from the retina into the vitreous and afterward became organized. However, he does not suggest the possibility of tuberculosis.

Fuchs[27] has described an atypical type of proliferating retinitis as "retinitis circinata." I believe it is quite probable that this is only another form of tuberculosis of the retinal vessels. The fibroid changes are again characteristic of what we know concerning tuberculosis elsewhere in the body—i. e., in the lungs, larynx, etc.—and represent nature's efforts to arrest further progress of the disease. However beneficial these changes may be in other organs, they are more or less destructive of vision when they occur in the eye.

A proper diet, an outdoor life, and the therapeutic administration of tuberculin will do much, in many of these cases, to save the remaining vision. In fact, this method of treatment will often restore some of that which has already been lost. Jackson[21] [22] [23] has undoubtedly saved the vision of two of his cases by this treatment. On the other hand, Black[28] [29] has a patient who has not done well in spite of all his skillful treatment. This case is the exception, as there may be a mixed infection present. New tuberculin (T. R.) should be administered in doses of 1/10,000 to 1/2,000 milligram. It is best to begin with very small doses and gradually increase. The injections should not be repeated in less than two, four, or even six weeks. We should give too little, as Parker[30] has mentioned, rather than too much. Gamble[20] has emphasized this, too. An exception to this is when tuberculin is given for diagnosis. Then it may be repeated every three, four or five days until a reaction is obtained. If old tuberculin (O. T.) is used, one-tenth to one-half milligram may be injected at the same intervals.

Von Hippel,[31] out of his large experience, has called our attention to the fact of the common relapses of the disease following, or in the course of, tuberculin treatment. This only serves to illustrate that tuberculin is like all other remedies—it will not prove suitable for all cases.

Among seventy-five cases of tuberculosis of the iris and ciliary body, relapses occurred in fifteen, and at intervals of from three months to three years after the end of the first course of treatment. In one hundred and fifteen cases of tuberculosis of the cornea there were twelve relapses. In eighteen cases of keratoiritis, three; in eight cases of conjunctivitis, two. No relapses in cases of sclera or choroid. The total number of relapses were thirty-two out of two hundred and forty-three patients. A long interval must elapse before one is justified in considering tuberculosis of the eye definitely cured.

Many patients object seriously to the use of tuberculin, especially if they experience the slightest reaction, even locally. This was true of the first patient I had last year. I agree with McCool[82] when he says, "I would almost prefer to be the second oculist consulted rather than the first, aside from the satisfaction of having made the diagnosis, because such patients often seek advice elsewhere." This unpleasant experience may often be avoided by injecting tuberculin in very small doses and at long intervals. This is very important to remember for the following reasons:

1. Moderately severe or severe reactions can be avoided. In most injections there should be only a slight local reaction, if there must be any reaction at all, because, if patients respond with moderate or severe general reaction, they are very liable to have new retinal hemorrhages, as evidence of the focal reaction, with loss of more vision. This is more likely with the first few injections than after the patient has been under treatment for a while.

2. The psychologic effect of small doses is desirable, since patients are much more likely to continue this important line of treatment. Remember, too, that this treatment requires months, or even several years; but even this prolonged treatment is better than blindness.

The administration of tuberculin has been left very largely in the past to the internist, who usually has only a very limited knowledge of fundus diseases. Much more progress along this line can be made if ophthalmologists will at least direct the treatment, as the fundus should be examined the second and third day following each injection of tuberculin, especially if there is any reaction. This is very necessary until the diagnosis is well established, but is not perhaps quite so necessary every time thereafter.

The fact that tubercle bacilli cannot be obtained for smears for very obvious reasons, counts for nothing in the diagnosis. Collins[33] has reported eighteen cases in which the eye has been enucleated for uveal tuberculosis. In one of these cases tubercle bacilli were found, in another their presence was doubtful, and in four cases they were looked for and not found. In one case a successful inoculation was made in the eye of a rabbit. But in fifteen cases the diagnosis seems to have rested on the symptoms, clinical course, and pathologic histology.

As Jackson[21] [22] [23] stated, "It is experiences like this which have caused the staining and search of suspected tissues for bacilli to be ranked below inoculation tests, as a foundation for the diagnosis of tuberculosis. The diagnosis of tuberculosis of the retinal vessels, by the diagnostic use of tuberculin, is more positive than the diagnosis of a syphilitic iritis, because a patient gives a positive Wassermann." However, we should not have undue faith in tuberculin, even in positive clinical tuberculosis, as this test cannot always be depended upon. Von Hippel[31] reports a case in which the enucleated eye was found full of tuberculous masses; yet the general reaction to old tuberculin was only obtained from the sixth injection containing five milligrams.

I have been able to find in the literature twenty-nine cases of retinal tuberculosis, which, with the three cases I have had, make a total of thirty-two. I perhaps could have found other cases in the literature and among my own records, but I have purposely excluded all doubtful cases. Since reading a paper upon this subject before the American Academy of Ophthalmology and Oto-Laryngology, at Memphis, Tennessee, last December, I have had the pleasure of seeing another case in the Colorado Ophthalmological Society, presented by Dr. Wm. C. Finnoff.[35]

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ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

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Large Recurrent Intraocular Hemorrhages.

CLEGG, J. GRAY (*Ophthalmoscope,* November, 1916), reports six cases of recurrent spontaneous intraocular hemorrhages in young healthy subjects. Such occurrences are more frequent in young men; possibly the menstrual flow in the other sex, acting as a safety valve, renders it less liable to occur. Also epistaxis is met with, and the suggestion is made that venesection may be beneficial as treatment.

Recurrent hemorrhages into the vitreous, according to Noll, may arise from

(a) Anomalies of the blood, as leukemia, oxaluria, pernicious anemia.

(b) Circulatory changes met with about the age of puberty.

(c) Local vascular diseases due to malaria, septic absorptions, amyloid, hyalin or sclerosing degenerations, hemophilia.

Intraocular hemorrhages in susceptible subjects have also been attributed to rapid changes of temperature, eye strain, vascular diseases, and all sorts of hereditary diseases and tendencies.

Axenfeld is of the opinion that many are the result of tuberculous disease of the coats of the choroidal and retinal veins.

In three of the cases there was a definite history of trauma, but the others were all spontaneous with no discoverable etiology.

The writer expresses himself as quite at a loss as to the explanation of these cases, in spite of all the suggestions made in literature. The known methods of treatment are by no means reliable, nor is it always at once evident which line of treatment will best suit an individual case. W. R. P.

A Case of Botulism.

LANCASTER, WALTER B. (*Ophthalmoscope,* November, 1916), reports a case the most probable diagnosis of which is botulism.

Miss X., aged twenty-three years, developed sudden diplopia, pain in her eyes and vertigo. Examination revealed total ophthalmoplegia, except of the sphincter of the iris—that is, there was complete ptosis—and on raising the lids the eyes were found to be immobile, pupils not dilated, and reacting slightly to light; distant vision apparently good, but requiring convex lenses to read fine print.

Vision not markedly diminished. Fundi normal. There was distressing nausea, greatly exaggerated by the slightest movement, moderate dysphagia, speech difficult, frequent vomiting. Later there was left facial paresis lasting about six weeks. General muscular weakness was present, especially marked in the neck, so that head could not be raised from pillow. Patient was somnolent, sleeping for eighteen hours a day; otherwise, mental condition clear and good. Pulse, 110; respiration, 25; temperature, 102° F. Otherwise, general examination negative. Von Pirquet and Wassermann also negative. Aspect of the case was that of severe toxemia. The source of the poison could not be traced.

The fever subsided by lysis at the end of ten days, and thereafter for over a month ran a course ranging between 98° F. and 99.4° F. The vomiting lasted for one day only, but the nausea continued for weeks; and even after months, a sudden movement in the wrong direction would cause nausea and vertigo. Somnolence lasted for twelve days. Appetite and strength slowly returned.

Six weeks later she was able to walk with help, but weakness and incoordination were still in evidence.

In another month, examination showed vision, with correction, 6/3 and 6/10. Right eye movable two millimeters in the horizontal meridian; left eye, three to four millimeters; no perceptible vertical movement. The ptosis diminished slowly, and the movements of the eyeballs also. Other muscles also improved. The diagnosis was based entirely upon clinical symptoms. It was evidently an acute paralysis of the muscles of the eye, throat and various other parts of the body.

The very rapid onset, the absence of gastrointestinal symptoms, and the presence of somnolence were the striking features.

The remainder of the article deals with the description of the different types of bacterial food poisoning. W. R. P.

Diagnosis in Uveitis.

Maxwell, Euphan (*Ophthalmoscope,* November, 1916), surveys the methods of diagnosis employed in clinical and scientific investigation of inflammation of the uveal tract, as found in the literature, and also deals with his own work on the subject.

The classification of de Schweinitz of the different varieties of uveitis is adopted.

Infection may be ex- or endogenous, bacterial or toxic. Endogenous infection may be classified as due to certain groups of diseases.

1. Constitutional diseases or disorders of metabolism—as gout, rheumatism, diabetes.
2. Specific infectious diseases—as tuberculosis, syphilis, gonorrhea, influenza.
3. Blood diseases—as anemia.

4. Renal disorders and anomalies of urinary secretion—as nephritis, lipemia, oxaluria.

5. Autointoxications—as in intestinal disorders, menstrual disturbances, detachment of retina.

6. Local diseases and infections—as in the rhinopharynx, tonsils, teeth, accessory sinuses, skin, etc.

7. Sympathetic ophthalmia.

The writer then cites the various diagnostic measures that might be adopted in a given case.

1. Clinical signs and symptoms of the patient.

2. Histologic or bacteriologic examination of uveal tissues or aqueous humor.

3. Routine bacteriologic examination of the blood, urine, feces, and mucous membranes.

4. Cytologic examination of the blood.

5. Clinical examination of the urine, feces and gastric contents.

6. Immunity reactions. Under this heading the writer discusses briefly the methods of search for the antibodies in the blood; the search for physicochemical changes in the blood, indicating the interaction of an antigen and its specific antibody, and, lastly, the anaphylactic reactions.

The author's account of his own work follows:

"The purpose of the experiments was to produce an artificial uveitis in a rabbit's eye by an intraocular injection of a known bacterium, and then in due course examine the aqueous humor for amboceptor. The first series of experiments aimed at the detection of amboceptor by the complement fixation method; the second series at discovering the presence or absence of its local production."

The technic employed is described in detail and the separate experiments reviewed. The essentials of the test are as follows:

A mixture containing (1) antigen, the infective agent, (2) the serum suspected of containing its specific amboceptor, and (3) complement, is allowed to stand long enough for union to take place between these three elements. A second mixture containing (1) red blood cells, and (2) a serum capable of hemolysing these cells, but from which complement necessary to this process has been abstracted, is then added. If the specific amboceptor be present in the first mixture, its union with the only available complement present makes hemolysis of the blood cells impossible; if absent, the complement is left free to unite with the second serum, and hemolysis does take place. (To be concluded.) W. R. P.

The Removal of Foreign Bodies by Means of a Giant Magnet.

POOLEY, G. H. (*British Journal of Ophthalmology*, January, 1917), describes his technic for the removal of intraocular foreign bodies. His general rule when foreign bodies were situated behind the lens are as follows:

1. Do not make any attempts to remove the foreign body before its situation has been carefully localized. Three or four days' wait makes no difference to the result.
2. Do not use a trial pull.
3. Do not pull on the ciliary body.
4. The foreign body should be removed from the nearest point.
5. Do not try to remove a foreign body embedded in the choroid.

His present practice is as follows:

1. If the lens is badly wounded, so that it must become opaque and swell up, and the foreign body is situated immediately behind it, to remove the lens and then to remove the foreign body by pulling it into the anterior chamber.
2. If the lens is not wounded, or only slightly wounded, or for other reasons it is not desirable to remove the lens, and the foreign body is situated behind the lens, to remove the foreign body by means of a conjunctival incision through the sclera behind the ciliary body, usually behind the insertion of the extrinsic muscles.

The Technic.—An anteroposterior conjunctival incision is made about three millimeters to one side of the side of the intended scleral incision, and a temporary suture passed round the insertion of the nearest rectus muscle for fixation. A small parallel incision, about four millimeters or five millimeters long, is made in the sclera with a Graefe knife, and the point of a giant magnet placed upon or just introduced into this. If really necessary, a very small transverse section of the sclera may be added if the foreign body cannot be coaxed through the linear incision; the wound should close easily and not gape; for this reason the cross section must be as small as will allow the foreign body to pass without bruising. The conjunctiva is sutured carefully at the end of the operation. Alypin anesthesia (retroocular injection) is used for all these cases.

The scleral route is the one preferred by the author, and has given the best results in his experience. W. R. P.

The Blood Pressure in the Eye and Its Relation to the Chamber Pressure.

SMITH, PRIESTLY (*British Journal of Ophthalmology,* January, 1917), by a very ingenious series of experiments on the pressure of water flowing through branching tubes, has endeavored to obtain a clearer idea of the pressure changes which occur in the blood stream as it passes through the eye.

The blood in the intraocular vessels, unlike the fluid in the chambers, moves with considerable velocity, and consequently suffers a loss of pressure between the points where it enters and leaves the eye. Under normal conditions its entrance pressure is said to be about 100 milligrams Hg. Its exit pressure cannot be far from 25 milligrams Hg. There is then a fall of pressure of something like 75 milligrams Hg. between the entrance and the exit points, which must take place chiefly either on the arterial side of the capillaries, on the venous side, or in the capillaries themselves. The present article approaches the question from the physical side and deals first with the principles according to which a mass of liquid flowing through a tubular system loses pressure as it moves along.

The experiments are shown in diagram, and the pressure charted graphically. The first experiments were with tubes of the simplest form, and then modified step by step so as to arrive ultimately at a branching system comparable in some degree with arteries, capillaries and veins. The first principle illustrated was: In a symmetrically shaped horizontal tube of uniform diameter the half-way pressure equals the mean of the end pressures; in one which enlarges in the middle the half-way pressure is greater than the mean; in one which diminishes in the middle, it is less than the mean.

What was found to be true for symmetric single tubes was also true for symmetric branching tubes: If the aggregate cross section of the branches at the half-way point of a symmetric branching tubular system is greater than the cross section at the ends, the half-way pressure is greater than the mean of the end pressures.

It may be inferred that if the vascular system were strictly symmetric—i. e., if the arteries and veins were alike in size and distribution, and all in a horizontal plane—the pressure in the capillaries would greatly exceed the mean pressures of the main trunks. The results obtained so far do not justify this inference, for the amount of the excess in question varies not only with the amount of enlargement in the middle region of the system, but also with the velocity and steadiness of the stream, and with the distribution of the resistance which has to be overcome. These factors must be taken into account, and the artificial streams must be compared with the blood stream in these respects, before any inference of the kind can be safely drawn.

The influence of velocity on the excess of pressure at the half-way point of a given tube is seen when we alter the velocity. It was found that the excess of pressure at the half-way point was smaller in relation to the total fall when the water flowed slowly than when it flowed fast. As regards the turbulence, steadiness of the stream was gained by diminishing the size of the tubes. The smaller tubes gave steadier streams and smaller deflections of the pressure tone.

Again, tubular systems that are alike as regards cross section may differ greatly as regards the amount and distribution of the resistance they offer to the liquid flowing through them, and this may modify the excess of pressure at the half-way point to a very large extent. This can be considered by comparing the amounts of resistance in different regions of a given tube, observing the varying slope of the pressure line. When the slope is steeper the resistance is greater.

The following conclusion was reached: A single tube and a branching system that are equal in aggregate cross section, that enlarge equally in the middle region, and that transmit streams of equal velocity, do not give equal excess of pressure at the half-way point. The excess is smaller in the branching system. If the vascular system were symmetric and horizontal, the pressure in the capillaries would exceed the mean of the pressures in the main trunks by a very small percentage only of the total fall. But the vascular system of the body is not symmetric in its proximal and distal halves. The veins —excepting the pulmonary veins—have everywhere a larger total cross section than the corresponding arteries. Near to the heart, when distended by the normal pressures, they have about twice the cross section of the arteries. It therefore remained to ascertain what happens when tubes which enlarge in the middle region are modified in like manner. We have seen that symmetric tubes of this kind give a distal fall in excess of fifty per cent of the total, and that the excess is smallest when the conditions of velocity, etc., most nearly resemble those of the blood stream. We may expect that in the corresponding asymmetric tubes the distal fall will bear a similar relation to twenty per cent of the total fall; and this proves to be the case.

The conclusion reached was as follows: If the vascular system of the body were horizontal, and if the veins had everywhere twice the cross section of the corresponding arteries, but were equal to them in number and distribution, the fall of pressure in the venous half of the system would be approximately one-fifth of the total fall. In any case, the ratio can be only true as an average. The pressure in the body changes continually under vasomotor influence. Contraction of arterioles lowers the pressure in the corresponding capillaries. Hence, if the pressure in a given capillary area is one-fifth of the initial pressure under ordinary conditions, it will be less than one-fifth when the arterioles feeding that area contract, and more than one-fifth when they dilate.

It is evident that the problems of blood pressure cannot be fully solved by considering, however carefully, the physical principles which are involved. The data at our disposal are insufficient. Yet these principles must be constantly borne in mind when we attempt to appraise the results arrived at in other ways. (To be continued.) W. R. P.

A Case of Multiple Aneurisms of the Retinal Arteries.

PRINGLE, J. A. (*British Journal of Ophthalmology*, February, 1917), reports an unusual case of retinal aneurisms unassociated with arterial disease. The patient, a private soldier, aged twenty-three years, complained of defective vision and blurring in reading. Previous history negative except that miner's nystagmus developed during six years' work in the pits. Examination showed vision, right eye 6/6; with correction, 6/5. Left eye, 6/5; no refractive error. Fundus, left eye: Some increase of connective tissue around the disc and along the vessels. Also a large patch of medullated fibers along the superior temple vessels, and a smaller indistinct patch further out at a lower level. The most striking feature in the fundus is the presence of three large swellings along an artery immediately below the first mentioned patch of medullated fibers; two of these swellings are pale pink with bright reflexes, which give them a pearl-like appearance, while the third or center one is of a deep carmine color. Several small dilatations are seen along the same vessel near the larger swellings. All other vessels are normal.

There was no spontaneous pulsation in any of the expansions, nor could any be produced in any of the aneurisms themselves, or in the artery beyond, by pressure on the globe.

The right fundus showed dilatations similar to those of the left eye in the inferior temporal and nasal arteries, the majority of which were situated in the extreme periphery of the fundus, and because of the slight nystagmus difficult to see. The writer feels certain of the true aneurismal character of the swellings, because of their situation, shape, and the fact that they were filled with blood. He is of the opinion that they are a congenital abnormality. W. R. P.

Some Eccentricities of Indian Ophthalmic Practice.

ELLIOT, R. H. (*British Journal of Ophthalmology*, February, 1917), writes very interestingly of the peculiarities of his Indian ophthalmic experiences. The article does not lend itself to abstract, but should be read in the original. W. R. P.

Bilateral Glioma of the Retina With Multiple Metastases.

TAYLOR, FRANK E., AND FLEMMING, N. B. B. (*British Journal of Ophthalmology*, February, 1917), report a case of bilateral glioma with pathologic examination. Retinal gliomata may spread in two ways:

(1) By involvement of the extraorbital structures of the face and head, either by (a) direct continuity of growth into the bones and other structures adjacent to the orbital cavity; or (b) direct extension of the growth backward into and along the optic nerve to the meninges and the brain; or (c) the occurrence of growths in the lymphatic glands in the neighborhood of the parotid gland, and also occasionally the involvement of that organ.

(2) By the formation of metastatic growths in various organs in distant parts of the body.

The former condition is much more frequently observed than the latter, as was shown by Wintersteiner's figures in an analysis of 497 cases of glioma of the retina.

The case here recorded is of interest because of the following conditions:

1. The presence of advanced growths in both eyes at the same time.
2. The very advanced condition of the growths when the patient was first brought up for treatment.
3. The presence of metastatic growths, both by direct extension into the brain and meninges and by metastases in the vertebræ, mesenteric glands, and ovary.
4. The relatively small amount of shock and other disturbance which followed so severe an operation as complete evacuation of both orbits in so young a patient.

The case was that of a little girl, aged three years, who showed on admission a growth protruding from between the lids of the left eye, which had been fungating for three months. The right eye was much enlarged and apparently proptosed. The iris was fully dilated and stretched into a thin band at the limbus. The lens was in contact with the posterior aspect of the cornea, being pushed forward by the growth behind. The latter was of a lemon yellow color, as seen by ordinary daylight, and also by oblique focal illumination. On ophthalmoscopic examination no reflex was obtained.

As regards treatment, an operation was performed within an hour of admission. The left orbit was exenterated. The lids were partly removed and the wound stitched up, an aperture being left for packing.

The right eye was very freely excised. The conjunctiva was removed and the optic nerve was divided three-quarters of an inch behind the globe. The nerve was found to be involved, being surrounded by growth for half an inch behind the eye.

The right socket healed readily. The left socket became septic, and the discharge had an unpleasant odor, but rapidly improved under irrigation with hydrogen peroxid and dressing with iodoform. The right orbit showed recurrence two weeks later, and exenteration was performed. The child went down rapidly and died one month later.

Pathologic examination showed the growths to be composed of closely packed small round cells, with large deeply staining nuclei, and extremely little surrounding cytoplasm. A few spindle cells were also present. Small syncytial masses, with multiple nuclei, forming the socalled giant cells, were scattered irregularly through the mass in scanty numbers. The intercellular stroma was extremely small in amount, being almost unrecognizable. There was much hemorrhagic extravasation into the growth, although blood vessels were few in number. Neuroepithelial rosettes were not found in the sections.

Photographs of the macroscopic and microscopic preparations accompany the article. W. R. P.

Concerning the Treatment of Tabetic Optic Nerve Atrophy.

BEHR, C. (*The Amer. Jour. of Ophthalmology,* August and September, 1916), says that the reason cerebrospinal lues yields to treatment, while general tabes does not, is due to the difference of localization of the spirochete infection. He shows that cerebrospinal syphilis is due to a spirochete infection of the meninges and their appendages, while tabes dorsalis and paralysis are due to an infection of the cerebral substance itself. The partial lack of influence of treatment on the last two affections is explained by the insufficient blood supply, which prevents a sufficient concentration of the remedy to destroy the organism. Another important factor is the time in which the therapy acts in these two groups. The whole question of curability of tabes or paralysis depends on an early diagnosis. By means of the dark adaptation a beginning tabetic degeneration of the optic nerve can be proved while the ophthalmoscopic findings are still negative. He divides the course of tabetic optic nerve affection into four phases: first, disturbance of the dark adaptation; second, atrophy of the papilla is added to the disturbed dark adaptation; third, visual acuity and visual field begin to retrograde; and fourth, total amaurosis and atrophy of the optic nerve.

He cites two cases. In the first, in which the treatment was begun in the third phase, there was some temporary improvement in the dark adaptation, but the process went on to total blindness in three years. In the second case the treatment was begun in the first phase, and the condition did not progress in three years.

These observations prove to the writer that the tabetic process can be influenced by therapy, and suggest a possibility of an improvement or cure of the whole tabetic process.

The writer believes that the cases of tabes for treatment should be carefully selected, because it is almost certain that some are aggravated by treatment. He cites four cases in support of this contention, and explains the rapid deterioration of the vision by showing that the remedial agent reaches the part greatly diluted, and by calling attention to the fact that a spirochete focus answers the treatment with a reaction which is the stronger the smaller the killing effect of the agent.

The writer then describes briefly a new experiment in the treatment of tabes: "We know that the cerebrospinal fluid comes in the main from the brain and spinal cord substance; that, therefore, in a certain sense it is a product of metabolism in the central nervous system. The parenchymatous stream comes out of the blood vessels; by means of the glia fiber system it reaches the working ganglion cells and nerve fibers, and then by means of the glia fibers it comes out of the brain into the ventricles, the subarachnoid and perivascular spaces. If, through a lumbar puncture, a large amount of cerebrospinal fluid has been removed, the secretion of the fluid in the tissue is incited thereby, the more so since from the puncture opening in the dura a slow fistulization takes place into the epidural tissue. If at the same time a specific agent has been introduced into the body on account of the increased metabolism, a greater quantity of this must enter the cerebrospinal tissues, by means of which the physiologic obstacles to reaching the therapeutic dose in the nervous tissue are probably considerably reduced.

"In my cases I have for months removed weekly, once or twice, about ten centimeters of cerebrospinal fluid during an energetic specific treatment. No damage resulted. The results seem to be so encouraging that I shall again take up this method on a larger scale after the war, and even now think I am right in recommending it." E. C. E.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

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CINCINNATI.

Ionotherapy in Episcleritis.

SIMON (Ionothérapie et l'episclérites, *La Clinique Ophtal.*, July, 1916) has utilized this method in six cases with very rapid results. The chief etiologic factors of the disease are rheumatism and gout, and the author has discovered that oral medication is very slow and disturbs the gastrointestinal tract, so he administers his drugs by direct local application. He makes no claims as to novelty, for Kubal used electric baths in episclerites over fifty years ago. Simon has devised a bath receptacle with a flange so as to prevent the fluid from overflowing. He uses a one per cent solution of salicylat of lithium directly upon the cocainized conjunctiva, but the drugs must be chemically pure to avoid irritation. If the negative is in the solution, the salicylats are liberated and from the positive electrode comes lithium. The intensity of the current is one milliampere for six minutes when salicylats are used, and one-half milliampere for three minutes when the other salt is used. The patient reclines, the eye is cocainized and the bath applied.

It is apparent that the more recent the lesion the more rapid the recovery, and the episcleral node disappears with the pain. Hot compresses are frequently used during the course of treatment, and hygienic measures are taken to combat future attacks. J. S. W.

Orbital Prothesis.

Valois and Rouveix (Prothese orbitaire, *La Clinique Ophtal.*, August, 1916). Since the war the cases needing treatment have been very numerous, and the destruction has changed ocular prothesis into orbital repair.

The first step is to make a mold of the cavity with a substance the melting point of which is higher than body temperature. There must be no swelling, and the cavity must be perfectly clean. The orbital surface as well as the contour of the fornices must be shown. A special funnel which has flanges to hold the lids in position is used in pouring the liquid slowly into all the crevices of the orbit. From this mold a reverse is made which is identical with the orbit. This must be carefully considered and the movable effects calculated.

As the muscles of the eye and Tenon's capsule are missing very often, leaving no stump, the studio of Royat has devised a most ingenious and valuable contribution. The surface of the prothesis is made of enameled hard rubber, and this is held against the lids, but a soft rubber pneumatic cushion is shaped in the mold of the orbit. This close application to the soft parts transmits every motion and makes a very presentable appearance. J. S. W.

General Medication.

Darier (Médications générales, *La Clinique Ophtal.*, August-October, 1916) uses mercury in nonspecific cases with good results. It has a topical action as yellow oxid in keratitides, a disinfectant producing antibodies. In small doses mercury is a tonic, but in large amounts it lowers blood pressure and has a hemolytic action upon the hemoglobin. Darier believes that sympathetic ophthalmia can be prevented in ocular trauma by mercurial treatment. Recent experiments have demonstrated that various metals are oxidoreducers, provoking a rapid and complete oxidation of toxins such as tetanus and diphtheria, and that mercury does not stand alone among the metals as a valuable bacteriotrope. This drug has also an absorptive action upon exudate. The various modes of administration are described. For rapid results inunctions combined with intravenous injections, and if the condition is very grave, subconjunctivally. Lanolin in a vasogen base form is the most readily absorbed vehicle.

Mercury, 100.0; unguent mercury, 15.0; lanolin pure, 100.0 is the best formula. A detailed description of the proper method of inunctions and inhalations is given. Before using intravenous or intramuscular injections, great caution should be exercised to prevent complications. Do not use insoluble salts in albuminuria. The mouth must be kept scrupulously clean, and in case of stomatitis, stop the mercury at once and irrigate the mouth hourly with chlorate of potash 25/1000, and touch the ulcers with tincture of iodin or with neosalvarsan, 0.5; glycerin, 10.0.

The use of sulphur (baths or internally) permits the use of stronger doses of mercury. The formulæ used are:

(1) Calomel, 0.5; camphor, 1.0; guaiacol, 1.0; olive oil, 10.0.

(2) Mercury, pure, 40.0; lanolin, 25.0; vasolin, q. s., 100.0.

One cubic centimeter of either formula is injected under great sterile precautions with a platinum needle.

The use of soluble salts necessitates the presence of the patient every day, but the danger is minimum, because their use can be interrupted at any moment. Darier prefers Hg. cyanid, 1.0; cocain, 0.5; water, 100.0, injected one to two cubic centimeters every other day, as less painful and more rapidly absorbed.

The ideal, most recent and practical method of treating lues, especially ocular manifestations, is by intravenous injections of the soluble compounds, because of the absence of all pain, no infiltration nodules, rapid sure action and no late secondary complications. The author injects two to three cubic centimeters of cyanid of mercury, 0.33; sodium chlorid, 0.08; sterile water, 100.0, into the vein at the elbow with a large hypodermic syringe, and has never had an untoward result. A series consists of thirty to forty doses, then a lapse of a month, and repetition two or three times.

The administration of mercury by mouth is inefficient and unscientific.

Darier continues his lengthy article describing arsenical preparations, their method of employment together with mercury, and the use of sulphur in addition. Salvarsan has a rapid and certain action, and the possibility of the patient leaving the hospital in a few days instead of weeks is most advantageous. Besides, there is without doubt a specific action upon the spirochetes.

Neosalvarsan is less toxic than 606, and the intravenous administration is much easier and fewer accidents result.

Salvarsanate of soda is easily soluble in distilled water, but the action is less uniform.

In the treatment of optic neuritis, retrobulbar affections and muscular paralyses, the administration of the arsenical preparations must be attended with the utmost caution. Intracranial or intraspinal injections of the salvarsanized serum have given many favorable results. Writers are divided upon the benefits in strabismus, ptosis and pupillary defects. Retinitides and diseases of the choroid respond only occasionally to this treatment.

The consensus of opinion is that arsenobenzol fails to penetrate the cornea in interstitial keratitis, and there is correspondingly no result. Syphilitic iritis makes a remarkable response, and cures of bad cases in ten days with relief of all symptoms in a shorter period are mentioned.

The status of salvarsan in sympathetic ophthalmia and in glaucoma has as yet not been determined.

A full description of the author's technic is given, and his method of using mercury and intramine as adjuvants. The routine is similar to that in a former paper abstracted for this journal. J. S. W.

The Iodid Ion in the Treatment of Cataract.

Simon de Guilleuma (L'ion iode comme traitement de la cataracte, *La Clinique Opthal*, October, 1916) passed a current of electricity through a medium of one per cent sodium iodid contained in an ocular electrode attached to the negative pole, while the patient held the positive electrode in his hand. The patient was sixty-nine years old, and was seen February, 1915, having 1/4 vision in the left eye and fingers at one meter with the right. At first he was given an eye bath of potassium iodid and calcium chlorate (Dor), which was used for five months. Then the ion treatment was instituted, one milliampere for five minutes, three times weekly for five months; at that time the vision was the same as in February. In view of the fact that previous observations had shown the cataract to be maturing rapidly, the author counts the maintaining of the vision as a success. The reviewer fails to see any of the advantages set forth by the author. J. S. W.

Involuntary Movements of the Upper Lid Associated With Those Controlled by Other Cranial Nerves. (Marcus Gunn Disease.)

Dore (Mouvements involontaires de la paupiere superieure associes a ceux commandes par les autre nerfs craniens, *La Clinique Ophtal.*, August, 1916) describes the disease called "jaw winking" in England. This consists in the raising of the upper eyelid whenever the lower jaw is dropped, and is one of the most perplexing questions in neuroophthalmology. The author describes the eighty-first case on record. From birth the patient had a partial ptosis of the right eye which could be controlled momentarily by frontalis action. A pronounced lowering of the mandible alone produced the elevation, which at times was five millimeters above the limbus, and the lid dropped the moment that the mouth was closed. The explanation of a congenital intranuclear synergism is not very satisfactory. J. S. W.

Concerning Intraocular Hemorrhages and Their Treatment—Hemorrhages of the Vitreous, Recurring Hemorrhages of Adolescents, Expulsive Hemorrhages, Retinal Hemorrhages, Etc.

Darier (Des hemorragies intra-oculaires et de leur traitement; hemorragies vitreennes, hemorragies recidivantes des adolescents, hemorragies expulsives, retinites hemorragiques, etc., *La Clinique Ophtal.*, September, 1916) quotes the article of Ormond and his methods of influencing the resolution of hemorrhagic effusions.

(1) Massage, (2) ionization, (3) subconjunctival injections, (4) aspiration of the blood and replacing with serum, (5) fibrolysin, (6) dionin, (7) iodid of potassium, (8) radium (using alpha rays).

The criticism of this inventory is that the two best measures are omitted: (1) Free bleeding by means of leeches or dry cups, (2) the use of autoserotherapy, viz., withdrawing fifty to one hundred cubic centimeters of blood from the basilic vein of the patient and injecting it under the skin of the abdomen every day or two.

The recurring hemorrhages of adolescents are chiefly due to syphilis, tuberculosis or to dyscrasias of various sorts which act upon the blood vessels or the chemistry of the blood. The cure is in discovering the cause, treating this, at the same time hastening the absorption by the beforementioned measures.

Intraocular hemorrhages following operations or injuries are most dangerous, as they may even result fatally. A compression bandage, head raised, and hypodermic of morphin are used. Emetine hydrochlorid, .03—.06, may be given intravenously. If the bleeding persists, two hundred to five hundred cubic centimeters of the following is injected into a vein: Sterilized gelatin, 20-100; calcium chlorid, 10.0; water, 1000.0.

Horse serum and other hemostatics are mentioned and as a last resort; enucleation with ligature of the nerve is used in cases of impending dissolution.

The treatment of retinal hemorrhages, including vascular thromboses, is the treatment hygienically and medicinally of the constitutional conditions which cause weakness of the vascular coats. The prognosis in over sixty per cent of the cases is bad. J. S. W.

Remarks Upon Induced Conjunctivitis.

VON SCHEVENSTEEN (Considération sur les conjunctivites provoquées, *La Clinique Ophtal.*, October, 1916) describes the more frequent selfinduced ocular diseases in the Belgian army: (1) Those produced by powdered ipecac. (2) The cases produced by unknown agents which have not been isolated.

Ipecac in the conjunctival sac produces in a few hours considerable mucus and a marked chemosis. The lids are very much swollen. The congestion varies, but at times there is found a distinct membrane. The duration is about three weeks from the initial dose. Repeated use makes the mucous membrane very sensitive to the slightest stimulus.

In acute cases the diagnosis is made from the inability to open the eye, unilateral condition, erysipeloid appearance of the lids, abrupt onset, and small amount of secretion.

In chronic conditions the truth is suspected when a lesion is monocular, confined to a salmon discoloration of the lower cul-de-sac in the deep folds. Manipulation easily produces injection, and there is little secretion. Finally it is at times possible to discover ipecac upon the soldier when the condition refuses to heal.

It can be differentiated from blennorrhea by the absence of urethritis in the victim, the failure of the disease to increase in virulence, and the negative bacteriologic examination.

The treatment consists in the removal of the ipecac and in the application of cold compresses. Atropin is used when the cornea is involved. A collodion dressing left in place for four to five days is applied when something else besides ipecac has been used. This dressing is renewed if necessary. Some of the irritants employed were soap, tobacco, snuff, pepper and even dental tartar scraped from the teeth upon retiring.

J. S. W.

Vernal Catarrh, Eosinophilia and Specific Treatment With Radium.

Butler (Catarrhe printanier, cellules eosinophiles et traitement specifique par le radium, *La Clinique Ophthal.*, August, 1916) says that the condition is not as rare as supposed if one looks for eosinophiles in both the secretion and the blood of the patient. There are three forms, namely, palpebral, pericorneal, and mixed, and the various descriptions of typical symptoms are given. All forms of therapy have not modified the course of the disease, although the work of Bayer, who cured cases by complete occlusion under glass, is mentioned. Radium alone has given results. The author reports two cases: the first, an adult male, who had been treated for trachoma, but the cobblestone tarsal conjunctiva gave out an eosinophilic secretion. Three applications of forty-five milligrams of radium bromid for three or four minutes brought about an absolute cure, leaving, however, a chronic conjunctivitis which resolved very slowly.

The second case was a boy of fourteen years, seen first in 1910, with a typical pericorneal involvement of both eyes. Treated by applications of small square plates covered with a varnish of radium (seven millimeters) with slow but perfect results.

J. S. W.

ABSTRACTS FROM SPANISH OPHTHALMIC LITERATURE.

BY

WILLIAM H. CRISP, M. D., OPH. D. (COLO.),

DENVER.

Morphology, Pathogenesis, and Treatment of Scleritis.

DELMIRO DE CARALT, Barcelona (*España Oftalmologica,* 1917, page 33). This paper is chiefly a discussion of the etiology of scleritis. The author considers that the classification of de Wecker has retarded for a quarter of a century the knowledge of affections of the sclerotic, which are usually merely the secondary expression of disturbances of the uveal tract. In the author's own statistics the papular and papulo-ampullary forms owed their origin in ten cases to oligoarticular pseudorheumatism, seven cases to gonorrheal infection, fifteen cases to genital infections, two cases to malaria, five cases to smallpox or pneumonia, two cases to subacute post-typhoid enteritis, three cases to chronic enteritis, one case to an infection of the biliary passages, three cases to maxillary sinuitis, one case to mastoiditis, four cases to dental alveolitis, one case to parotiditis, and some others to tonsillitis.

Of the subacute type, sixty-three were of the nodular form and only three gummatous.

Keratitis From Bee Sting.

ARANA, Cadiz (*España Oftalmologica,* first year, page 19). The patient came three days after having been stung in the left eye by a bee. There was marked edema of the eyelids. The cornea was slightly infiltrated, above all in its lower outer part, in which appeared a white spot two millimeters in diameter; and in the center of this spot was a dark point, giving the impression of a foreign body and actually consisting of the sting. The bulbar conjunctiva was strongly hyperemic, there was a mucous secretion, and the patient complained of marked periorbital pain. The sting was extracted, and under the use of atropin and vapor baths with dionin the eye recovered after twenty-three days, there being left merely a slight leucoma. The case differs from other cases which have been described by the absence of hypopyon and of capsular cataract. The former is explained by the author as due to the absence of definite infection, and the latter by the fact that the injury was peripheral. He produced experimentally a slight lesion on two rabbit eyes, which were subsequently kept under aseptic dressings. In neither case did hypopyon develop, whereas in the eye in which the puncture was central, capsular cataract developed, and in the eye in which the puncture was peripheral there was no such change.

ABSTRACTS FROM SCANDINAVIAN OPHTHALMIC LITERATURE.

BY

WILLIAM H. CRISP, M. D., OPH. D. (COLO.),

DENVER.

Corneoscleral Cyst With Migration of Epithelium Into the Anterior Chamber and Secondary Glaucoma.

HAGEN, S., Christiania (*Norsk Magazin for Laegevidenskaben*, seventy-seventh year, page 1567). A boy of ten years came to the clinic in November, 1915, with a history of the right eye having been ruptured with an axe three years previously. The eye had done well, retaining good vision until the beginning of 1915, when he had had an irritative disturbance of about three weeks' duration. Another attack of inflammation had occurred in September, 1915, but this had subsided, and in the last three weeks a protrusion of the old site of rupture had developed, and had progressed rapidly.

On examination there were found photophobia and lacrimation, with some conjunctival and ciliary injection. At the lower margin of the cornea, about in the vertical meridian, was seen an almost hemispheric bleb-like protrusion measuring eight by ten millimeters, with the greater diameter horizontal, and encroaching about two or three millimeters on to the cornea. Both the walls and the contents of the bleb were relatively transparent. The lower part of the iris was absent, the remainder of the cornea, iris, and anterior chamber fairly normal. The vision of the eye was counting fingers at one meter. The ocular tension was forty millimeters of mercury. The other eye was normal. Puncture of the cyst failed to produce any marked improvement in the eye, which was, therefore, enucleated in the latter part of November.

Microscopic examination showed the posterior wall of the cyst, which consisted of the inner corneoscleral layers, to be pierced by an opening in such fashion that the cyst was separated from the intraocular space by a thin membrane, composed of iris pigment. The inside of the cyst was lined with epithelium of multiple layers. That part of the epithelium which covered the iris pigment in the opening toward the intraocular space had a slightly different appearance from the remainder. The cells were more irregularly arranged, with larger interspaces, and there was no sharp limitation of the epithelium toward the underlying edematous web which separated it from the iris pigment. The impression was given that at this point there was a filtration between the intraocular space and the cyst. The ciliary body and iris were atrophic. The epithelium which lined the cyst was continued as a band of epithelium between the remains of the iris and the cornea into the anterior chamber, although it was impossible in any of the sections to demonstrate an open communication between the cyst and the chamber. In the anterior chamber the epithelium covered the anterior capsule of the lens and the whole colobomatous and pupillary field, and also extended on to the iris above to the line of its adhesion to the cornea. Communication between the anterior and posterior chambers was thus completely cut off. The optic disc was excavated.

SOCIETY PROCEEDINGS.

BY

ARTHUR J. BEDELL, M. D.,

ALBANY.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Regular meeting, held December 18, 1916. Dr. William E. Gamble, the President, in the chair.

Sinus Disease as an Etiologic Factor in Iritis.

Dr. E. E. Irons and Dr. E. V. L. Brown contributed a joint paper on this subject. In one hundred cases of iritis studied etiologically for luetic, gonococcal, tuberculous, dental, tonsillar, sinus and other infections, the authors found abnormalities of sinuses suggestive of infection in eighteen cases, but considered sinus infection the only etiologic factor in the three cases given below. In the other fifteen cases the etiologic factor was considered to be luetic in six, gonococcal one, dental one, tonsillar one, and so combined that no one factor could be considered the certain factor in six.

Case 1.—Housewife, aged forty-five years. Left acute iridocyclitis; duration three weeks; relieved by atropin, etc. Just previous to the eye trouble the patient had had a cold, with nasal discharge. Frontal sinuitis was found clinically and by X-ray. Slight tonsillar infection was noted in one tonsil. No clinical or laboratory evidence of dental, luetic, gonococcal, or tuberculous infection could be found. (One, three and eight milligrams O. T.) Tuberculin used under careful control, and after due consideration of the general condition of the patient. Treatment of the sinus was refused.

Case 2.—Printer, aged thirty-four years. Bilateral chronic iridocyclitis; duration, off and on since nine years of age. Pansinuitis, but no other evidence of active tonsillar, dental, luetic, gonococcal or tuberculous infection could be found on careful clinical and laboratory study. (Seven milligrams O. T.) Three weeks' atropin treatment had no effect upon the pupil or the "rose flush." Operative sinus treatment was refused.

Case 3.—Male, aged twenty years. Left chronic serous iridocyclitis began in February, 1913. The right antrum had been drained seven months before. After the tonsils were removed in August, 1913, the eye condition improved, but during 1914 there were repeated exacerbations, with occasional periods of fever, sub- and intracutaneous and intramuscular tender nodules, but no change in the slight presystolic apical heart murmur, during two years of observation. Blood cultures during three of exacerbations remained sterile. The teeth were normal, and there was no clinical or laboratory evidence of luetic, gonococcal, or tuberculous infection. (One, three and seven milligrams O. T.) A complete reexamination during a recurrence in August, 1915, revealed an active antrum infection. The antrum was drained and cultures of the pus showed a slightly hemolytic streptococcus. The eye improved. A suspension of one hundred million killed streptococci was injected subcutaneously as a test of sensitiveness to this organism. Forty-eight hours later right ciliary injection became more marked and the clear left eye became red. This reaction lasted forty hours and then subsided without local treatment. Four days later the procedure was repeated with a similar dose, and after twenty-four hours the same reaction appeared in the right eye, with some pain, but no redness in the left, and subsided within seventy-two hours. February 2, 1916, the patient reported the eyes improved, and the rhinologist stated that the sinuses were clear of infection. In this patient the evidence seemed fairly clear that the source of the recurrences of the iridocyclitis was a persistent infection of the sinuses.

Discussion.—Dr. Alexander S. Rochester said that the cases reported by the essayists reminded him of a case which he treated some months ago, particularly when the essayists spoke of the possibility of not finding a present sinus trouble. He saw the patient in his third attack of iritis within a period of two years. In each attack the patient was taken care of by a competent oculist, a different oculist each time. Each time he had been referred by the oculist to a rhinologist, but examination of the nose had not disclosed any sinus trouble. Each time the patient had had a "cold" in the nose at the time the iritis came on. Each attack lasted for several months, and with the usual treatment of atropin, hot applications and sodium salicylat the eye had gradually cleared up, the patient being told he had had rheumatic iritis. When patient consulted the speaker he had an iritis which had begun three or four days before. In examining the nose he used the suction apparatus which Brawley had spoken of, and which he thought was of great value. The first day he was not able to find anything pathologic in the nose at all. He used atropin and hot applications, and the next day the patient's eye was worse. On examining the nose again and putting the patient on the suction apparatus for a while, at the end of about twenty minutes some pus escaped from the anterior ethmoidal region. Within several hours after this the eye was very much better, and in two or three days quieted down. He kept up the use of the suction apparatus and the eye became completely quiet, and later on he opened up the ethmoid so as to establish drainage. He thought the suction apparatus was of great value in the diagnosis of these cases, as well as of great aid in their treatment where it was necessary to use conservative methods.

Dr. Harry S. Gradle asked whether Dr. Brown considered the iritis in sinus disease an infection or a toxemia.

Dr. Brown said he considered it to be an infection transferred by the circulating blood. Blood cultures had been made in the last case, but were all negative.

Dr. Michael Goldenberg mentioned a condition in point where it affected the optic nerve. The wife of a dentist developed a unilateral neuroretinitis which was very marked. Every form of examination had been made, and nothing could be found that might account for the condition. The teeth were X-rayed, a Wassermann examination was made, urinalysis and blood count made, and a radiograph of the skull was made in order to show up the ethmoidal cells. In the ethmoid region on that side, in one spot was seen a small area of possible infection. The matter was placed before the husband, and he was told that the speaker did not feel that that was the cause of it, but that was the only thing that could possibly account for the condition. It was decided to open the ethmoids, which was done. No pus was found, but in the substance removed, after floating in water, there was a little membrane which took the form of a bag, that was possibly a cyst. The eye began to recover in a comparatively short time. Patient was nevertheless placed on small doses of mercury and iodid of potassium. The eye recovered with almost normal vision. In the course of a month or so afterwards she developed an acute infection of the antrum on that side, which was easily diagnosed by transillumination and irrigation. At the same time another attack of neuroretinitis which was just as marked as the preceding one developed. Vision went down to 20/200. The antrum was drained, and the patient made a perfect recovery. She has not had a relapse for a year and a half or more.

Dr. Frank Brawley, in referring to the point raised by Dr. Gradle, as to whether these conditions are due to a localized infection or to toxemia, stated that in his experience he had gained the impression that a toxemia is really the cause. He had had a number of cases, some of which he had reported, where rapid improvement resulted from the evacuation of the sinus or followed the use of the suction pump and drainage, so that he could scarcely see how one could explain it on any other ground than that of a toxemia. The case cited by Dr. Rochester would tend to support that theory, particularly as Dr. Brown and Dr. Irons had found absence of organisms in the blood with the most careful technic.

Dr. Harry S. Gradle did not think that the conditions of optic neuritis, and uveitis due to accessory sinus trouble, were at all identical. He agreed with Dr. Brawley that sinus disease was probably due to toxemia, but optic neuritis, due to accessory sinus disease, was an extension of the process to the soft tissues from the accessory sinus through the orbit involving the intracanalicular portion of the nerve. The same therapeutic measures would tend to relieve the two conditions.

Dr. J. B. Loring stated that in determining the etiologic factor we might think of several things to assist us: either there is an increased infection occurring, or a diminished local resistance. He recalled a case he had quite a number of years ago, at the time of the celebrated "boodle trial" in Chicago. An attorney concerned in the defense of that suit was doing an immense amount of work and had infection of the antrum.

He was also subject to lues. It was thought that his case of iridocyclitis was due to syphilis, but as thorough treatment as could be carried out at that time failed to give any appreciable relief. The case persisted. After the antrum was drained effectively the trouble rapidly subsided. This man was doing an excessive amount of work at that time, and the iritis came on.

Another case, seen two or more years ago, was that of an artist decorator in the city, who was also doing an excessive amount of work at that particular time. He had noticed no change so far as the antral disease was concerned, having known that it was present for some time, and it having been recommended that the antrum should be drained. With his hard work he was practically prostrated. The iridocyclitis followed. Prompt relief was afforded after drainage of the antrum and keeping it up. Perhaps a close study of these cases might reveal points of increased focal infection. Take arthritis, where there is usually either an exacerbation of the focal lesion or a diminished resistance at the point of onset, as seen in trauma, not that trauma has anything further to do with it than the production of a local diminished resistance. In the same way in a joint infection, the infection not involving the synovial secretion, but being external to the joint, there is a similar anatomic circulation in the villi in the joint, as in the ciliary body and in the iris, increased irritation inducing stasis, rendering infection much more liable to be set up.

Dr. Benjamin Bailey, Lincoln, Nebraska, congratulated Dr. Irons and Dr. Brown on the work they had done along this line. Ophthalmologists had followed the old nomenclature of ciliary, specific, traumatic iritis long enough, and when they did not know the cause, and there had been no trauma and syphilis could not be demonstrated, the iritis was put down as being of rheumatic origin. He believed that the procedure undertaken by Dr. Brown, if followed up, would amount to a great deal. It was high time that ophthalmologists discriminated more closely regarding each type of iritis met with. In common with other ophthalmologists, he had had the same result in finding oftentimes ethmoidal or accessory sinus disease of some nature that complicated the iritis. Again, he had been unable to find the cause, and had to depend upon the usual remedies for treatment which the doctor had suggested—atropin, hot applications, and salicylat of sodium, etc. If this work was carried on, we would be able to revamp the nomenclature and get the different forms with greater accuracy, and consequently would have better methods of treatment as the result of these investigations.

Dr. George F. Suker asked Dr. Brown whether in his experience with these cases he had noticed that in some types the iris as a whole or only a section of it was more acutely inflamed than the other adjacent areas. Could we not have in some of these conditions a localized iritis, one that did not involve the entire iris? This might give some clue as to the selective tendency of these toxins and the relation to the question of infection.

Dr. Brown, in replying to Dr. Suker's question concerning the type of the iritis, said the first case was an ordinary acute iridocyclitis, with only one (deep) synechia. In the second case all parts were markedly inflamed, iris, ciliary body and choroid, and no part of the iris was exempt from the inflammation. The third case was a severe serous iridocyclitis with only slight involvement of the iris aside from the great difficulty experienced in securing dilatation of the pupil.

New Observations on Cornea and Retina of the Eye.

Dr. Robert von der Heydt gave a translation of a lecture delivered February 26, 1916, by Dr. O. Haab, of Zurich, Switzerland, on this subject, from which we take the following extracts:

"By the method of focal illumination and the loup I have been able to first describe and isolate a keratitis which I called the "gittrige" (grill-like). Later the ribbon-like keratitis (Baendertruebung), especially in infantile glaucoma, which was recently so thoroughly described, clinically and anatomically, in a thesis by Staehli. Then I have found the pupillary reflex which I have called "cortical reflex" (Hirnrindenreflex), and now am able to describe to you a new form of keratitis which I have called "alphabet or letter keratitis" (Buchstaben-keratitis).

"While we have made few changes in the loups used for investigating, there has been much improvement in the method of focal light, especially since we have the Nernst lamp, giving a very strong and white light. With it one does not alone see better, but actually more than with the ordinary gas or electric light.

"The Nernst lamp has been recently improved by Gullstrand in the form of a slit (spaltlampe), with which we can easily see the corneal nerve fibers, as well as study the direction of flow of the aqueous, as recently described by Berg (Stockholm), which has been experimentally proven by my able assistant, Turk, when he described the causation of the Ehrlich vertical fluorescein line in the aqueous.

"Lately I have also used the still more powerful electric Osram lamp, which is constructed according to the half Watt system. Its illuminating power is near that of actual sunlight, so that with it one can observe the reflection of the socalled magic Japanese mirror.

"These small mirrors are made of bronze, and on their reverse side show ornamentations such as animals, flowers, plants, or inscriptions. The front surface is absolutely mirrorlike, but in a certain diagonal direction in good illumination you may with some difficulty see a faint reflection of the figure on the back, caused by very slight alteration in the mirrorlike surface and corresponding with the respective design.

"Now, about the corneal disease I have designated 'Buchstaben keratitis.' It is a rare affection. I have discovered seven cases in the past eighteen years. For its observation a very intense lateral illumination is necessary. One sees superficially small and larger zones composed of short, straight, raised, linear cloudings of the epithelium, sometimes crossing one another. In arrangement they resemble straight letters, such as A, W, V or X. The larger lines may for a certain length be followed by a parallel double border. Scattered among them may be small round infiltrated zones, or a line may be interrupted by a group of these dots.

"There is mild ciliary irritation. In one to three weeks the process may terminate, but the characteristic part of this keratitis are sure to follow severe relapses. Reduction of intraocular tension may complicate, and finally permanent clouding of the stroma and corneal surface may destroy the usefulness of the eye.

"This severe type of eye disease is illustrated in this twenty-five-year-old patient. She was discharged from our clinic, October 28, 1915, after a year's treatment. Previous to this she had been under the care of four oculists. When we first saw her the useful vision of the left eye had been lost by corneal clouding. Her right eye had been involved for nine months previous to her visit to our clinic, and it showed distinctly the characteristics of the 'Buchstaben keratitis.' In a most discouraging manner, and in spite of all treatment, the condition continued to progress for six or seven months. In this otherwise healthy individual a roentgenogram showed a very light shadow in left lung, and as the tuberculin reaction was positive, we commenced using tuberculin Beranek, twenty-six injections, without visible improvement.

"Her right eye was rapidly approaching the condition of the first involved left eye, and possessed only a fraction of visual acuity. We then commenced injecting old tuberculin (Koch), and a radical change took place at once, ciliary injection subsided rapidly, cornea became smooth and commenced to clear up. After one month vision was 5/60, four weeks more 1/3 to 1/2, and a year after her admission to our clinic same was 6/8. Now, after four months, you see an absolutely quiescent eye, with a mild corneal clouding; vision, 6/6.

"The old tuberculin treatment was carried out for three months, twenty-four injections, slowly increasing, seven milligrams was maximum. Her first involved eye, which shows peculiarly radiating linear cloudings, showed no change; vision, 1/10. There is no doubt in my mind that her right eye was on the way to a total loss of all useful vision, and this was avoided by the use of old tuberculin."

Part two of the lecture deals with new observations on the fundus.

Dr. von der Heydt, in connection with Professor Haab's lecture, exhibited and reported two cases which bore some relation to the change described in the lecture. One was a case of choroidal rupture, wherein after six months a red spot was seen in the macula. The other case was one of old neuroretinitis in which the same red spot was observed. He had noticed and studied these red spots in one case for six months intermittently, and in the other for about two years. Both had shown identical characteristics. At one time both spots, most markedly the one in the lady, were surrounded by a definite halo. This was an edema of the retina, and was definitely outlined and like a horse's collar in shape. Later on these edematous zones flattened out and disappeared; they are practically gone now, but the reddish pathologic center shows decidedly. Thus in these two cases radically different causes brought on similar foveomacular changes as a manifestation of insult to the retina.

A Method of Operation in Complete Obliteration of the Anterior Chamber, With Report of a Case of Corneal Staphyloma.

Dr. C. G. Darling said that during the past summer he performed an iridectomy in a case of corneal staphyloma by making a very minute opening into the anterior chamber well back in the corneal limbus with a keratome, using sawing movements. This was enlarged as soon as he entered the anterior chamber with probe-pointed scissors; a spatula was passed between the iris and cornea to free the iris before introducing the iris forceps. In this case he obtained an almost immediate as well as a permanent flattening of the staphyloma and normal tension. Later, when looking up the literature of this subject, he found this operation was similar to Gayet's method.

A short time ago a man entered his service at the County Hospital with a serpent ulcer of ten days' standing. Only a two or three millimeter margin of the cornea was left after perforation and healing.

A large staphyloma of the cornea was forming under the continuous use of a pressure bandage; the tension would rise, a fistula would form; this would close and tension go up again, with increase in size of the staphyloma; then the process would go through the same cycle again. The lens was still present in the eye.

Here the iris was very much stretched, thin and adherent to the corneal rim, only two or three millimeters from the limbus, so he did not feel he had enough room in which to do any of the operations of which he had spoken, or that any of them would open the iris angle, as the iris was probably adherent at the angle, and would remain so after ordinary iridectomy, as the iris would tear before freeing the angle.

An iridectomy was done in this case in the following manner: Heine's cyclodialysis operation was done opposite the widest area of sound corneal rim. The spatula, when in the anterior chamber, separated the iris from the cornea; it was passed forward until the iris was somewhat torn from the corneal rim, the spatula being well curved so that it hugged the back of the cornea. With the point of a keratome, using sawing movements, the spatula was cut down upon well back in the limbus so that the cornea would be left untouched and the iridectomy would be well to the root of the iris, to give good drainage. This incision was enlarged with scissors, but he believed a canaliculus knife, if very sharp, would have been better, as he does not think it would cause as much trauma. The iris forceps were now introduced, the spatula removed, and an iridectomy about three millimeters wide was made at the first attempt. Wishing to make the iridectomy wider, he had to reintroduce the spatula to get the iris forceps between the iris and cornea. This was done on one side and then the other of the primary attempt, giving an iridectomy over ten millimeters wide, well back at the root of the iris. This operation has caused some flattening of the cornea, decrease in tension, and a little vision—now hand movements. The cornea in this case was so extremely thin that any tension above a negative one would cause some bulging, so another iridectomy was attempted on the opposite side of the cornea four days ago. On this side the iris had been more stretched and was very thin and atrophic, so that a piece of it would tear out whenever taken hold of. Here he passed the spatula forward, and cut the iris from the cornea rim for about one-third of its circumference, and as the iris is of course freed from the cornea at its root at the same time, this freeing of the iris should act fully as well as iridectomy in establishing an anterior chamber and drainage. He saw the case today, and the corneal curvature is perfectly regular.

Dr. Darling, in closing, thought the method he had described was of some advantage in saving eyes, especially in children with large perforating corneal ulcer, as the eye would aid in the growth of that side of the orbit. In a good many cases of ulcer of the cornea from gonorrheal ophthalmia and other diseases in children, the eyeball had to be removed, and the orbit on that side did not grow. If this operation could be done, freeing the iris from the cornea, or an iridectomy done, the eyeball would be preserved, with possibly a little vision, and the orbit would grow on that side.

Sarcoma of the Choroid.

Dr. Lawrence J. Hughes, Elgin, Illinois, spoke of having presented a case two months ago which was diagnosed as sarcoma of the choroid. The case was discussed by Dr. Fisher at the time, who thought it was a typical case of this disease. Shortly after that the speaker removed the eye, and, so far as macroscopic examination of a section of the eye was concerned, there was no evidence of sarcoma.

Ventricular Injections for Tabetic Optic Atrophy.

Dr. George F. Suker said that through the courtesy of Dr. Gradle and Dr. Goldenberg he had had the opportunity of showing two cases this evening. They were both cases in which ventricular injections for tabetic optic atrophy were resorted to. Both operations were performed by Drs. Gradle and Goldenberg, the speaker simply assisting them. The patient of Dr. Gradle's had had three injections, and his field of vision had perceptibly increased. In this instance sixty cubic centimeters of ventricular fluid was withdrawn and the patient injected. He received one-twentieth to one-fiftieth of a grain of bichlorid of mercury, and his mentality had decidedly changed for the better. The other patient was also a tabetic, of whom a positive report was made of absence of patellar reflexes. Now, if this was the case, that the patellar reflex had been restored after being absent in a case of tabes, it was an exceptional instance—an anomalous condition. Taking it for granted that the absence of patellar reflex was positively determined in this case, but was now present after bichlorid of mercury injections, the speaker would consider the man not to be a true tabetic, but a senile dement. In other words, he had progressive dementia, the cerebral type or the cerebrospinal type of syphilis. In contradistinction to tabes or senile dementia, the man would maintain his vision and keep what he had and improve, because if ever there was a syphilitic condition that was favorable, it was the cerebral type of lues, particularly in those cases in which one got a modified type of Argyll-Robertson pupil, which this man possessed.

He urged Dr. Goldenberg to watch the man carefully and take his field of vision at intervals, and inject him rather frequently. If ophthalmologists had a right to do experimental surgery, they had a right in doing so in these two cases. The personality of one patient had undergone a remarkable change. The prima facie evidence was in the ophthalmoscopic appearance of the disc. An accurate record of the field of vision would determine the progressiveness of cases of optic atrophy.

PAUL GUILFORD,
Secretary.

Meeting held February 21, 1917. Dr. Paul Guilford, the President, in the chair.

Exhibition of a Case of Aniridia.

Dr. Emory Hill reported the case of a girl, aged nine years, whose vision had always been poor; the eyes had always oscillated, and the pupils were very large. There seemed to be practically complete absence of the iris; the ciliary processes were not visible; the cornea, lens and vitreous were clear, the fundus appeared normal; there was myopia and astigmatism. Family history negative; no history of similar ocular defects. The nystagmoid movements resembled the searching movements of an almost blind eye more than nystagmus. At times a vertical, at other times a horizontal, motion is most noticeable. She had glasses three years ago, correcting 2.5 D. myopia and 3.25 astigmatism, which now give 20/100 vision. Refraction showed a little more than —2.50 in each eye, and —4 cylinders in each eye with 21/70. The absence of corneal or lenticular opacities and of any evidence of heredity was very unusual. It is supposed that absence of the iris is the particular eye defect which most often shows a history of some ocular defect in past generations. The theory generally accepted is that it is a defect of development, and not the result of intrauterine inflammation.

Dr. Hill thought that perhaps the theory suggested by Hess, and supported by George Coates, that there is a stricture advancing around the lids which means a new growth, and the iris eventually protrudes these two, allowing the entrance of the iris between the lens and cornea, was a good one. All of the theories suppose that there is something which interferes with the pushing in of the lens.

Discussion.—Dr. William A. Mann reported a similar case, in which the best vision he could obtain was, for the right eye, —9 gave 20/200, and the left —5.5— gave 10/200. The patient was a drug clerk who, using —6, said he could not read well with his glasses. His lens had a number of striations, and the fundus was indistinct. Bifocals, with the addition of —3.50 for close work, gave him Jaeger 6. There was no hereditary history.

Dr. Charles P. Small said that in his case, beside the aniridia, which he considered congenital, both corneæ were sclerotic. The patient was thirty years old; she had gone to school and could see perfectly well until she was about fourteen. The first symptom was a cataract, which developed in the right eye. This was needled, and the white spot appeared on the cornea shortly afterward, and increasing until it covered the lower part of the cornea. In the left eye the periphery of the lens showed striæ. She could not expect much increase in vision because of the sclerosed condition of the corneæ, although from 4/200 it had increased up to 11/200. There was marked lateral nystagmus. Family history was negative.

Dr. Hill, in closing, said that one point which was worthy of mention was the frequent inflammatory reaction after any attempt at operation upon these cases. So far as he knew, there were very few reports on the anatomic findings in these eyes. Generally there were the rudiments of the ciliary processes; there was a stump of the iris which had been adherent, and there had been reported a considerable overdevelopment of the pectinate ligament, the condition remaining in the adult eye as it was in the fetal eye.

Luetic Keratitis.

Dr. Edward F. Garraghan presents a girl, twelve years of age, whose vision in both eyes was very good until April, 1916.

The right eye was reddened but not painful; vision, 5/200. The cornea showed no ulceration, but presented deep infiltration with a whitish mass. The iris reacted under atropin, and was kept dilated. The teeth were slightly irregular. The Wassermann test gave a four plus positive reaction. The patient had been placed on potassium iodid up to thirty drops, three times a day, and given mercurial rubs. The infiltration had gradually cleared up until at present vision was 20/40, and there was no sign of infiltration.

Tubercular Keratitis.

Dr. Garraghan also presented a patient, aged twenty-seven years, of good family, married nine years, one child, a girl, aged eight years, who is delicate and has enlarged glands. The patient had had four operations in eighteen months, three times on an old goiter. There was a slight swelling over the right eyelid. One month after the goiter operation last May, the right eyeball became inflamed. The conjunctiva became injected and the cornea became involved. The sight gradually diminished and there was almost constant pain. Examination showed the sclera very much injected and painful to touch. There was deep corneal infiltration. The iris reacted sluggishly to atropin. Wassermann test negative, von Pirquet positive. There was severe exacerbation of all the eye symptoms. Tuberculin was given by injection, one-half milligram, which after eight to ten days was increased to one milligram, and after another ten days to one and one-half milligrams. The eye had gradually improved under the treatment.

Family History.—Mother died two years ago; cause unknown. Father died ten years ago; had had considerable bronchial trouble. One brother died of tuberculosis. The patient's child has tuberculous glands. The diagnosis was made on the subjective findings. The patient was on iodid for a while, but grew worse. On the tuberculin she had improved.

Discussion.—Dr. George F. Suker asked whether the cornea in the little girl with inherited syphilis presented any small islands of apparent infiltrates from which linear striations seem to arise and pass into the corneal stroma, or if corneal striations were the principal feature.

Those with the first named condition made a far better recovery, as to visual acuity, and yielded more readily to efficient treatment, than those cases which came under the second group.

He referred to the two types of syphilitic keratitis—one in which the spirochete can be found in the meshes of the cornea, and in such cases the keratitis is a direct expression of the activity of the spirochete; in the other type the keratitis is the apparent result of the syphilitic toxin itself, the spirochete not being present in the cornea, but may be occasionally found in the circumcorneal tissue.

In the first type the corneal involvement is not as deep as in the second or striated type. In the former the antispecific treatment is much more efficacious than in the second type, in which latter the general constitutional condition needs very much greater attention.

As to tuberculous keratitis, he warned against the promiscuous use of the diagnostic tuberculin test, for in many in whom it was used in which a focal reaction followed, the eye went from bad to worse. The ophthalmologist should not make the test without the collaboration of a competent internist. Small therapeutic doses at longer intervals are more effective and safer than rapidly increasing doses at comparatively short intervals. No dose, either therapeutic or diagnostic, ought to cause a focal ocular reaction, as more often than not, greater harm is done than is gained by establishing the true diagnosis. A thorough physical and clinical examination, including X-ray chest pictures and the like, will often obviate the use of a confirmatory diagnostic injection.

For the therapeutic injections, begin with the smallest dose and be extremely cautious about increasing it; always be guided by the physical and clinical condition of the patient resulting from the injection, whether to increase or decrease the therapeutic dose. In such cases, not only the local treatment is of value, but the general constitutional treatment of tuberculosis is of as much if not greater value.

Dr. Suker called attention to an admirable article on the subject by Dr. Hiram Woods, presented at the Memphis meeting (1917) of the American Academy of Ophthalmology and Oto-Laryngology, which fully expresses his own views on the matter in concrete form, and advised the members to avail themselves of this article.

Dr. Oscar Dodd said he had had a number of cases of tuberculosis of the cornea, and felt like emphasizing the point made by Dr. Suker regarding too large doses or too rapid increase. Even with the greatest care he had frequently seen focal reaction, and the condition made very much worse, it sometimes taking two or three weeks to quiet the eye so that further treatment could be given. His method of treatment was to keep the dosage of the tuberculin down to a point where it did not cause any marked focal reaction, and in these cases he had seen beneficial results. He thought oculists did not pay sufficient attention to the handling of these cases in a general way. If the patient was not under good hygienic conditions no amount of treatment would be of avail. Good results may be obtained where the patient has good care, with plenty of good food and fresh air and the other things generally used in tubercular cases. In cases where the hygienic conditions could not be controlled, the condition was bound to grow worse in spite of anything that could be done. Dr. Dodd differed with Dr. Suker as to the time between injections. He thought they should not be repeated too frequently, but believed a small dose given once every week or ten days, if the case was watched carefully, was all right.

Retinal Detachment.

Dr. Garraghan said that his case of retinal detachment was interesting because of the great extent of the separation, having the appearance of a plaited funnel. There were no premonitory symptoms, and almost complete sudden blindness. From the standpoint of treatment little could be expected, as the case was of two months' standing when first seen. The case was that of a young man, aged twenty-two years, first seen on January 3, 1917. Two months previously he became aware of blindness in right eye in a rather peculiar way. Having a sensation of foreign body in the left eye, he closed the lid, and for the first time became aware of blindness in the right eye. No history of injury; no pain in the eye. Transillumination shows absence of tumor; no increased tension; only light perception. There is complete detachment of retina.

The Interrelation Between Eye, Ear, Nose and Throat.

Dr. Joseph Beck said he might have entitled the presentation better by calling it the discussion of exophthalmos and recession or protrusion of the eyeball, for that was what the cases represented. He presented the cases from the standpoint of the conditions about the head and neck, and particularly emphasized the factors which had presented themselves in these cases in relation to the production of exophthalmos and enophthalmos, and especially in reference to the treatment which could be said to bear relation to the laryngologist.

Case 1.—Recession of the eyeball. This patient had been referred to Dr. Beck on account of severe pain on the side of the head and inability to breathe through the right nostril, and a marked recession of the right eye. The conditions at that time were not seen by Dr. Loeb, and Dr. Beck did not make the measurements by the instruments most of the men were familiar with, but by another. A marked difference was very apparent in the two eyes. There was also a paresis of the hypoglossus, and intense pain and paralysis of the right recurrent laryngeal nerve, and a loss of sensation in the superior laryngeal nerve. There was slight atrophy of the shoulder muscle, although the movement was all right. There was a hard irregular tumor the size of a hen's egg on the side of the neck, growing quite rapidly, which developed after the patient came to him, and also a tumor on the back of the nose, from which he removed a piece which appeared to be a sarcoma. On the drum there was a linear, port wine, reddish mark which looked as if there had been a hemorrhage inside the drum. In the course of time there was rupture of the drum. The ears were treated, with the result that the tumor practically disappeared. There was now one on the other side which looked like glands. The eyeball had gradually come forward, the recurrent laryngeal nerve had begun to act, so there was some action in the vocal cord, and there was some sensation.

The proposition was, what was the cause of the recession of the eyeball. They had assumed that the cause was an irritation of the sympathetic, a destruction of the sympathetic and exophthalmos.

Case 2.—This case was one of marked exophthalmos in a young lady, of whom Dr. Beck showed photographs taken at different ages when she had no exophthalmos. The exophthalmos developed gradually with the growth of the tumor. The proposition was the disappearance of all her symptoms of exophthalmic goiter after the operation that is now in vogue, the removal of tonsils in connection with exophthalmic goiter. The young lady had not been under his care for this operation, but she had two very beautiful scars; one for the purpose of ligating the thyroid vessels, and the lower incision was made for the removal of the goiter. Subsequently her tonsils were removed. The patient came to him on account of nasal trouble. Operation was done on the thyroid, and after it the nose became completely blocked. The condition was a myxedematous structure, and there were other symptoms of myxedema. This patient had the usual effect on the pulse rate, the body weight, etc., and the nasal obstruction was very troublesome; this was probably a permanent condition. He had never seen a case where the desired results were obtained and still the eye remained the same.

Case 3.—This woman, so far as the history shows, never had a tumor. She came with marked symptoms of exophthalmos, the goiter, the toxic symptoms, and complained about the eyes. When she first came the protrusion had been much more marked than at present. There never was a tumor, and is none at present. Following ligation there was marked improvement in the general condition. It is known that ligations never cure a case, and the thing now was to do something permanent. Dr. Beck believed that the tonsil was a factor in the condition, and he had removed the tonsils under local anesthesia without any bad effects whatever. There was not as much bleeding as in a normal individual, and the removal was followed by good results and a gain in weight. In due time toxic symptoms developed after the ligation, the improvement being of only short duration. The removal of the tonsils, however, was done in Rochester after the thyroidectomy. Dr. Beck had asked Dr. Crile about this last summer, and he believed in the importance of the tonsils in connection with the thyroids and removed the tonsils after the thyroids.

Discussion.—Dr. Clarence Loeb had not seen the first case until the eye was in the process of returning to its former condition. At the time he saw it there was a definite recession of the right eye, which had since returned to the level of the other eye, as measured by the exophthalmometer. The young lady had a most pronounced exophthalmos, so much so that it was impossible to measure it with the instrument, as the cornea extended beyond the last line. He had not seen this patient until the condition was well established.

He saw the other case shortly before her tonsils were operated on. Neither patient presented all the typical signs of exophthalmos. In both cases there was free movement of the eyelids, and there was a protrusion of the eyeball. The staring appearance of the eyes was very noticeable.

As to the irritation and paralysis of the sympathetic, he had always been taught that the exophthalmos was due to a paralysis of the sympathetic and the exophthalmos due to the irritation. At first, he was inclined to scout the new theory, but it must be remembered that, although the other symptoms very frequently improve rapidly after a removal of the gland, the exophthalmos often remains. So it may be that there was a paralysis. If irritation of the sympathetic caused the exophthalmos, removal of this irritation should, theoretically, be followed by recession of the eyeball.

So far as the treatment of the exophthalmos was concerned, this varied from performing Kronlein's operation to resecting the cervical sympathetic.

Dr. George F. Suker asked the members to examine these patients to help him verify a symptom he had investigated at the Cook County Hospital in a number of exophthalmic goiter cases—a deficient complementary fixation in lateral rotation of the eyes.

One patient was made to look to the extreme right, with head straight forward, and to fix a point for a second or two which was held three or four feet from the patient, and then the fixation point was rapidly swung into the median plane while the eyes were to follow it. During this rotation it was observed that the left eye properly followed the fixation point, while the right eye lagged behind and suddenly jumped into fixation with the left eye when the object reached the median plane, thus causing an apparent divergency for a moment.

Dr. Frank Brawley supported Dr. Beck's statement that the tonsillar infections played a great rôle in the thyroid disease. He thought those men who were seeing a good many tonsil cases very frequently saw cases where the acute thyroid irritation subsided rapidly following the removal of the tonsils, and this was particularly true where it had been determined by careful plate cultures that the streptococcus was present in the hemolytic or viridans form.

Dr. Clarence Loeb, in closing, stated that the fundus was normal in both cases. He thought the fact that winking was present prevented any irritation of the cornea as a result of the protrusion. He would certainly look for the Suker sign in all cases of exophthalmic goiter which he saw hereafter.

Dr. Harry S. Gradle asked how Dr. Beck accounted for the exophthalmos.

Dr. George F. Suker asked how Dr. Beck accounted for the fact that the pupils were always small in exophthalmic goiter.

Dr. Beck, in replying, said he believed there were certain fibers which were destroyed, and others not. We know that in the vestibular nerves there were two distinct paths for the superior canals and for the horizontal and vertical canals, and yet it was the same nerve. They also acted differently to stimulation and to the different degrees of stimulation. He thought it was possible that these fibers which had to do with the mechanism of the iris were not destroyed, whereas those which control the vessels which are behind the eyeball could be irritated or destroyed. Immediately after death the exophthalmos disappeared, and that may mean that other fibers stimulate the vasoconstrictors, and each nerve in the sympathetic has those two components.

He thought perhaps Dr. Suker was right, that when one cut both nerves the protrusion would go back, but he had never seen it demonstrated.

The Visual Requirements of Military Aviators.

Dr. Charles P. Small said that the advent of the aeroplane in modern military equipment had made it necessary to modify to some extent the method of physical examination of applicants. It is of the utmost importance for the aviators to possess normal functions presiding over the maintenance of bodily equilibrium under a definite set of conditions. It was of equal importance to know the ocular conditions present, not only the visual acuity, but the entire ocular apparatus.

Huss (Marine-Oberstazarzt), in his recommendation for the eye examinations of flyers, includes the history, objective examinations, refraction, acuteness of vision, visual field taken roughly by the hand, and pupillary reaction. Unless the subheadings "Objective Examinations" were more comprehensive than would generally be included under that term, there were a number of very important omissions in this list for the routine examination.

Visual acuity of 20/20 in each eye is, of course, of prime necessity. In the British army the standard for general service requires, without correction, vision of 6/24 in the better eye and 6/60 in the worst eye, which must be the left. In Germany combatants are required to have correctness in vision of at least 6/12 in one eye, while in the other the correct vision may be minimal, and in the Landstrum the second eye may even be blind. In the armies of Germany, Austria, France and Italy more than six D. of myopia are allowed, but because of the constant demand upon the eyes, from the time the aviator begins his ascent until he has made a landing, a visual acuity of less than 20/20 vision in each eye might be a serious handicap. Even with normal vision in his eye, the aviator must have a normal binocular vision, as otherwise his estimation of distances, of the relation and location of places and objects, would be valueless, and his own safety as well as that of his machine would be in serious jeopardy when attempting to make a landing. There should also be normal muscle balance as well as good abductive and adductive power.

The presence of nystagmus should disqualify an applicant. A cycloplegic should be used in all cases, not only for determining absolute refraction, but in order to see the peripheral parts of the fundus and detect any evidences of previously existing iritis or uveitis.

One of the most important features of eye examination seems to have been altogether ignored, namely, the examination of the color sense.

The speaker thought that there should be a reexamination of the eyes at least once a year, as sensitiveness of the retina, the endurance of the eye muscle, etc., could be determined only after practical trial.

The successful applicant for army aviation service should have: 1. 20/20 uncorrected vision in each eye. 2. Binocular vision. 3. Absence of nystagmus. 4. Normal muscle balance and competent ocular muscles. 5. Normal media and fundi. 6. Normal visual fields, by perimetric examination. 7. Normal color sense.

Discussion.—Dr. Wesley Hamilton Peck said there was one feature in the paper of Dr. Small which he had thought of for some time, and that was in referenec to supplementing the aviator's vision by the use of photography. He thought if by the use of the latest improved cameras with rapid exposure shutters, rapid lenses and the fastest plates or films, various pictures were taken from aeroplanes or dirigibles, such as stereoscopic exposures which when viewed through a stereoscope would give the correct perspective, and others through telescopic lenses to give the largest possible detail of parts of the enemies' camp, or moving picture exposures which could easily be projected, and 3¼ by 4¼ cameras with an astigmatic lens and regular negatives made from which could be made stereopticon lantern slides, and exhibited to the staff of army officers at headquarters at any magnification desired, much valuable aid might be rendered, as the aeroplanes have demonstrated that they are of the utmost value and indispensable in modern warfare in doing scout duty and directing the fire of artillery. The aviator is naturally fully occupied attending to his duties, and many details necessarily escape his eyes which the camera would collect and preserve for future careful study.

Dr. Clarence Loeb spoke of the requirements in the United States service. He had been connected with the mobilization in Missouri, and the standard for the line was 20/40 or better in the right eye, and 20/50 in the left. No attempt was made to examine the fundus or test the refraction or the color sense.

Dr. Harry Gradle said that Dr. Stanton had shown him the requirements, and he thought they included a high degree of visual acuity. Dr. Gradle considered the requirements were now too low and should be raised.

Dr. Small, in closing, said, in answer to Dr. Gradle's question, that at present the requirements were 20/20 in each eye.

He thought our service should be maintained at a very high standard. There was no provision made for the examination of the color sense. The muscles should show not only normal balance, but should have good adductive and abductive power. The labyrinth was tested simply to see if there was normal reaction. Rejections were made if there was not normal reaction.

MAJOR H. WORTHINGTON,
Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of December 16, 1916. Dr. E. E. McKeown presiding.

Tuberculosis of the Retinal Vessels.

Dr. Wm. C. Finnoff presented Mr. L. E. B., aged twenty-eight years, a rancher by occupation. Had chickenpox as a child. When twelve years old had a severe attack of influenza; since that time has enjoyed the best of health. Denies having had venereal diseases. Has not had a chronic cough, nor has he lost weight recently. Three years ago he complained of symptoms of eye strain, and was given lenses which gave him relief. Family history good.

Some time in October his eyes became very red and painful, but without marked photophobia or lacrimation. Noticed that upon arising suddenly from a stooping posture he saw yellow and gray spots in the periphery of the visual field. There was no pus in his eye. This lasted about ten days and gradually disappeared until he was apparently well. The eye was not treated. Shortly after this attack he came to the city and was employed as bookkeeper.

In November, 1916, the eye became red and painful. Photophobia and lacrimation became so severe that they interfered with his work. The symptoms rapidly increased in severity until it was only with the greatest effort that he was able to keep his eyes open.

He consulted him November 17th, complaining of severe photophobia, profuse lacrimation and ocular pain. Vision both eyes 6/6. There was marked circumcorneal injection of both eyes. The right cornea had two deeply located, fine, oval, grayish infiltrated areas in the upper temporal quadrant, two millimeters from the limbus. The upper opacity was one and one-half millimeters in diameter and was denser. The lower was one millimeter in diameter and was separated from its fellow by one millimeter of clear cornea. The left cornea had two opacities in the lower temporal quadrant, which were larger than those in the right cornea, and two small ones, pin point in size, in the pupillary area. The infiltrates were grayish in color, without blood vessels, and did not stain.

The pupils were dilated and revealed the following: The margin of the right optic nerve was ill defined. There were two oval patches, about one-fifth of a disc diameter, of grayish exudate, one covering the superior nasal vein and the other the superior nasal artery. These were seen near the margin of the nerve head. Two similar patches could be seen covering the first upper branch of the superior temporal vein, and these were separated by about one-half of a disc diameter. The intervening portion of the vein was slightly constricted. The vein was not markedly distended distally to the infiltrations. Because of the marked photophobia, the examination was discontinued; atropin, five per cent dionin, and calomel were prescribed, and a subcuticular injection of tuberculin given.

November 20th: Pupils dilated and lacrimation less. No change in the corneal opacities. Fundus examination revealed, in the right eye, numerous patches of exudate covering the retinal veins. The veins somewhat distended, and near several of the exudates irregular. All of the patches are to the temporal side and in the periphery. Reports from his dentist negative. Wassermann negative. Urine negative.

November 22nd: Right eye, no change in corneal opacities. Increase in number of retinal exudates, and those formerly present have increased slightly in size. Left eye, no change in cornea. There is a slight irregular haziness over inferior temporal vein. These changes are apparently a focal reaction, but not constitutional.

November 26th: Corneal opacities not as dense as when last seen. Fundus much the same.

December 2nd: Vision right eye, 6/12; vision left eye, 6/15. Corneal opacities show slight improvement. The right fundus presents two large opacities on the temporal side near the equator; one, about two-thirds the size of the nerve head, yellow and covering the vessels; the other, lower and about one and one-half times as long as the disc and one-half as broad, is yellow with irregular edges. Two new opacities, about one-fifth of a disc diameter in size, cover the lower nasal vein. In the left eye four small patches were found far forward covering the veins, which in this vicinity are irregular.

He gives a history of having a suspected tuberculous cow in his herd from which he received milk. Thinking that there might be a possibility that this was the bovine type of tuberculosis, a 1/2000 milligram of bovine tuberculin was injected subcutaneously December 5th.

December 8th: Vision right eye, 6/30; vision left eye, 6/30. In the right eye, along the lower temporal vein, in the upper part of the eye, corneal opacities very much improved.

December 12th: Fundus picture much the same.

December 16th: Vision both eyes, 6/30. Corneal opacities very much smaller and only seen with condensed light. In the right eye the larger patches of exudate have disappeared and been replaced by smaller hemorrhages. There are other small hemorrhages in the region of the patches of exudate. The left fundus shows little change from the last examination.

With the history of consumption of milk from a probable tuberculous cow, and the appearance of a more decided focal fundus reaction after the administration of a small dose of bovine tuberculin, the possibility of the bovine type of ocular tuberculosis is worth careful consideration.

Discussion.—Dr. Edward Jackson thinks this is undoubtedly a case of tuberculosis of the retinal veins, but with less hemorrhage than he has usually seen. His own cases of proliferating retinitis are well, with almost normal vision. This case of Dr. Finnoff's has manifestations of the disease in the ciliary body and vitreous. Therefore, Dr. Jackson thinks this may be the primary focus in the eye. Dr. Jackson's case shows only manifestations in the retina. Dr. Verhoeff, of Boston, has suggested that the retinal disease is secondary to the disease of the ciliary body and choroid.

Dr. F. R. Spencer also thought this case was undoubted tuberculosis of the retinal vessels, as it is very much like the three cases he has just reported before the American Academy of Ophthalmology and Oto-Laryngology at Memphis.

Dr. J. A. Patterson reported a case he had last year under observation with involvement of the ciliary body and choroid. This case had a lardaceous deposit on Descemet's membrane. He now has a case, referred to him by a colleague, which he is taking care of during the latter's absence. This case is not improved by any luetic treatment, but is responding to tuberculin treatment.

Dr. Melville Black asked Dr. Finnoff if general reaction followed the administration of bovine tuberculin of one milligram. Dr. Finnoff answered in the negative, and stated that only a local and focal reaction followed. Dr. Black emphasized the importance of care in giving tuberculin. He thinks bovine tuberculin should be administered in Dr. Finnoff's case. He stated he saw all of his cases late, and that they don't respond well to treatment when there is so much involvement of the retina and vitreous. All of his cases have had a very hazy vitreous when first seen; the vessels were proliferating into the vitreous masses. The accessory sinuses may be tuberculous.

Dr. Patterson asked if there are any reported cases of ocular tuberculosis due to bovine tuberculosis. Dr. Finnoff stated that Verhoeff thinks ocular tuberculosis is due to bovine tuberculosis, this having been acquired from milk.

Dr. Black stated that he had had a number of cases, in his clinic, of eczematous conjunctivitis in bottle fed children, and he is watching these children for manifestations of bovine tuberculosis. He thinks the treatment with tuberculin is very important, but the tuberculin should be given very cautiously.

Interstitial Keratitis.

Dr. E. T. Boyd presented Miss I. H., aged sixteen years.

Family History.—Eyes were sore shortly after she was born, and were very bad for the following sixteen months. Vision has never been good since. At the age of eight or nine she was greatly troubled with her eyes; they would get red, and at times she would be able to see but little.

Her condition at present is as follows: Right eye, on the anterior capsule of the lens, a little below the center, there is an opacity; slightly deeper in the lens substance there is another opacity. Left eye, in the center of the anterior capsule there is an opacity, and another more deeply in the lens substance. The corneæ show evidence of former interstitial disease. There is horizontal nystagmus. The Wassermann test was negative.

Discussion.—Dr. Black said the poor vision and the nystagmus go together, hand in hand. He also said that the parents of this child haven't been with her in the clinic, and it is very difficult to get a good history of the infantile disease from the child. The blood Wassermann was negative. He thinks she has not had ophthalmia neonatorum. Dr. McKeown asked the age limit for 606. He thinks it can be given at any age, and this seems to be the consensus of opinion.

Dr. Spencer stated that his case of interstitial keratitis, shown at the November meeting in Dr. Coover's office, had responded well to neosalvarsan. In fact, at the time of writing up these transactions, January 8, 1917, the eye has entirely recovered with good vision.

Ectropion of Lower Lid.

Dr. Melville Black presented a man, aged twenty-five years, who has always been exposed to bad weather. He has a fair complexion, and showed not only marked ectropion of each lower lid, but marked eversion of the puncta and lids. Dr. Black slit the lower puncta with sharp pointed scissors, and made a vertical cut down each lid from the punctum. He then cut out a triangle about two millimeters in size. This made a larger punctum, which is much easier to bring in contact with the eyeball. After doing this, Ziegler's cautery punctures were made deep into the tarsal plate of each lower lid at a number of points, so at the time this patient was presented before this society, the lower lids rested against the eyeball in proper position and the puncta drained the tears perfectly. He used for this Todd's cautery point.

The right lower lid was punctured four times, from two to four millimeters from the lid margins. This was all done one week prior to the meeting. He first syringed the tear ducts to make sure there was not advanced disease in the tear sacs, as, of course, it is impossible to get the best results in such cases until the disease of the tear sac has been properly treated. He emphasized the importance of having a patent tear duct, if one expects to obtain the best results by this method of treatment in any case.

Optic Atrophy.

Dr. H. R. Burns presented Mrs. J. D., aged twenty-eight years. Vision both eyes, 2/200. Sudden and complete blindness came on January 6, 1916, lasting for two weeks, when the vision slightly cleared, but has never been any better than at present.

The week before Christmas, 1915, she had tonsillitis and influenza, but was not attended by any physician. At that time her husband took home a bottle of whiskey, from which the patient drank a few hot "toddies." While convalescent she took a teaspoonful of strong whiskey two or three times a day. On Christmas day, 1915, her vision was hazy; in fact, so much so that she did not look at her Christmas presents, because of her inability to see clearly. A few days after Christmas her vision was quite hazy after arising, but would clear up a little during the day. The patient had never been troubled with blindness or hazy vision until after drinking the whiskey.

January 3, 1916, urine found to be loaded with albumin. January 6th, sudden blindness. One physician suggested an anesthetic and abortion; another advised this and gave medicine, which was followed by a miscarriage on January 13, 1916.

Flashes of light were seen about one week after the child was born, at which time she could plainly see objects. This lasted for about six weeks. The patient claims her vision has improved.

Provisional diagnosis: Optic atrophy, each eye, due either to nephritis or alcohol, as there is a history which makes each a possibility.

Discussion.—Dr. Walker said a patient in charge of Dr. Monaghan was advised to have an abortion. This case was very similar to the one Dr. Burns has just presented. This patient has had a child since, with no eye trouble. There was marked optic atrophy. Vision each eye, about 20/70,

Dr. Boyd thinks the history of alcoholism is merely a coincidence, and that the disease is due to nephritis, or rather the nephritis of pregnancy.

Dr. Patterson believes the tonsillar disease may have been a bigger factor than has been emphasized. He believes the whiskey should be examined for methyl alcohol, as he suspects the optic atrophy is due to methyl alcohol.

Dr. Black said the whole macular region was covered with dots of pigment due to a neuroretinitis of pregnancy, but he feels a competent chemist should examine the whiskey for methyl alcohol.

Dr. Sedwick has had two cases of methyl alcohol atrophy in one eye of each case during 1916, since the state went dry.

Dr. Strickler thinks this case is undoubtedly due to methyl alcohol poisoning.

Disease of Optic Nerve and Retina Due to Accessory Sinus Disease.

Dr. E. E. McKeown presented a man with a history of failing vision in the left eye. His vision was 20/200. This returned to normal, and then two days ago was 20/200. His vision was 20/70 when first examined. Today (December 16, 1916) it is 20/100. He can see one letter in a line and not the next letter to it. He has a central scotoma with a good form field. Wassermann negative.

Discussion.—Dr. Black thinks the blind spot should be measured on a campimeter, and the teeth and the sinuses thoroughly examined by X-rays. He believes the accessory sinuses should be examined by the X-ray, which he thinks will not show the presence of pus, but that the sphenoidal sinuses are the ones chiefly diseased.

Dr. Spencer said this case was very much like his case presented before the first Colorado Ophthalmological Congress. He believes the optic nerve and retinal disease is due to disease of the sphenoidal sinuses and the posterior ethmoidal cells. The sinuses should be X-rayed.

Traumatic Conjunctival Hemorrhage.

Dr. Black reported injury to a railroad man who had been pinned under the débris in a wreck. He showed a conjunctival hemorrhage in one eye, but the vision was not tested at that time. He came to Denver to consult Dr. Black, and brought his lawyer with him. The good eye could examined and the retina clearly seen with a plus seven in the ophthalmoscope. The poor eye could be seen with a lens of the same strength. Each eye showed some astigmatism. His manifest refraction was briefly taken, and his vision was improved to approximately 20/40 in each eye with the correcting lenses. Dr. Black explained to him that he needed glasses. This seemed to be a disappointment to his lawyer, as they were counting upon suing the railroad.

Steel in the Vitreous.

Dr. McKeown reported that the case with steel in the vitreous now has 20/30 vision, since the lens has been needled and the steel removed from the vitreous with a giant magnet. The steel was in the eye two years. This same case was shown at the March meeting of the Colorado Ophthalmological Society in 1916, at Dr. McKeown's office. He explained that he wanted to remove the steel long before he did, but the patient would not consent to this. The society congratulated him upon the good result when he failed to have the cooperation of the patient and when the steel had remained in the eye for so long a time.

Meeting held January 20, 1917. Dr. J. W. Lehan presiding.

Brain Tumor.

Dr. W. A. Sedwick presented Mrs. E. J. H., aged forty-seven years, married. Always perfectly healthy until a year ago, except for some pelvic disturbance, for which she was operated; five healthy children, the youngest two years of age. No miscarriages. During the past year has been very nervous, with a pain she cannot describe in her eyes. Vision has gradually failed until now it is 1/80 each eye. There has been a feeling of drawing in the right side of face. Considerable stupor for the past five or six months; once it was hard to awaken her for three days. She would brighten a little, seem to know someone was present, but would lapse again. Has had severe headaches, especially in the afternoon, with sick stomach and projectile vomiting. Memory practically gone. Extremely constipated, but thinks this started following a pelvic operation three years ago. Pain all over head, but worse on top.

Status Præsens.—In addition to the above, pupils react to light and convergence and consensually; media clear; optic atrophy right eye; papillitis left eye. Fifth nerve, normal mastication. Sensory fifth, no tender spots. Anesthesia to upper branches on right side to all qualities. Seventh nerve, slight drooping of the corner of the mouth and facial paralysis, which is increasing. All tendon reflexes right side increased. Romberg positive. Intention tremor on right side; patellar reflex exaggerated on the right; staggers in gait at times; no Kernig. Negative luetic history. Wassermann and urine negative. No hemianopsia.

Diagnosis.—Tumor, probably of the pons—right localization.

Discussion.—Dr. J. A. Patterson said that it was useless to have a Wassermann blood reaction in cases where lues was suspected in the nervous system. The spinal fluid must be examined for that purpose. He cited the following case: A man of about sixty-two or sixty-three came complaining of diplopia which is homonymous and comes and goes. He was unable to demonstrate the muscle affected, although at times a six degree prism, base out, will produce instant fusion, at other times not. Both images are on the same level; no vertical diplopia. There is a suspicion of lateral nystagmus, but it is too slow to be accurately recorded, and cannot be altered by position. The patient complains of dizziness when thrown back quickly in a barber's chair; an attempt to take the same position in an office reclining chair failed to cause dizziness or nystagmus.

Right eye vision, 6/9; with + 0.50 cyl., ax. 180° = 6/7. Vision comes and goes. Left eye vision, 6/15; with + 0.50 sph. ○ + 0.50 cyl., ax. 180° = 6/6.

Some Romberg; tendency to fall to the left. Patellar reflex greatly exaggerated. Four years ago Wassermann for blood, negative. Right eye, pupil five and one-half millimeters; does not contract readily to light. Left eye, five millimeters; light reaction prompter. Consensual and convergent reactions normal.

Fields: Right eye, form about normal, color inside twenty, with interlacing red and blue. Left eye, normal form and color.

Ophthalmoscopically, nerve not particularly atrophic, very large opacity about center of vitreous, small vessels on disc are tortuous. There are patches of pigment above nerve, and toward periphery very large series of patches up and in at two o'clock. This pigment is distributed everywhere toward periphery, and appears like retinitis pigmentosa, excepting that the patches are located distinctly along the vessels and are below them. The fundus is tigroid in appearance, with glistening crystals in macula.

Hearing: Right ear, whispers, two meters; left ear, six meters.

Spinal fluid shows a very positive Wassermann. He is receiving salvarsan by the spinal method.

Discussion.—Dr. Edward Jackson spoke of a case he had seen recently with a weak superior rectus. It was hard to determine just what trouble was present with the ocular muscles. The patient has had some rheumatism, etc., but it was impossible to determine anything definite in his condition. He feels that some of these obscure cases are due to the central nervous system, and it is very difficult to make the diagnosis from the ocular lesion alone. He believes that a spinal fluid Wassermann is best in such obscure cases to determine the etiology.

Dr. W. A. Sedwick asked if a decompression operation would be of any benefit to his patient, and if it would save the vision in the better, or left eye, as this is the one showing the papillitis.

Dr. M. Black thinks the papillitis is too old for the patient to be benefited by the decompression operation. He believes thta it will be very difficult to do anything for this case. He thinks a decompression operation might tide the patient over a critical period in the early stages of papillitis, but in this case, on account of the long standing, it probably will not do any good.

Dr. W. H. Crisp spoke of a Jewess from a tuberculosis sanitarium, whom he had under observation. She had had loss of weight, but the lung signs were all negative. She consulted him because of headache and blind spells. He found choked discs, and, in spite of all he could do for her, her eyes went from bad to worse. She was seen by a neurologist in consultation, and a decompression operation was done without any improvement. Blindness came on slowly, but surely; and, therefore, Dr. Crisp thinks Dr. Sedwick's case will not be improved by a decompression operation.

Unusual Cataracts.

Dr. D. A. Strickler presented Mrs. G. W., twenty-eight years old. Dimness of vision in the right eye, which she first noticed about five years ago. Has been subject to headaches since that period. Has had two children; one seven and the other three years of age. No history given as to the cause of the trouble.

In the right eye lenticular opacities were found which were more dense in the posterior central region. Less dense opacities project forward like the petals of an opening flower. In the left eye one larger opacity could be seen extending forward, with numerous pin point opacities spreading through the anterior portion of the lens.

Vision right eye, 20/200; left eye, 20/30. With correcting lenses, vision each eye 20/30 on January 5th, and on January 20th, 20/20.

This case is presented because of the unusual character of the opacities.

Is this the coralliform cataract of Nettleship and Ogilvie?

Discussion.—Dr. M. Black thinks this case is of congenital origin. The patient can close her poor right eye without closing the left, but cannot close the good left eye without closing the right. In other words, he believes this winking test, when positive, is almost pathognomonic of a congenital etiology, as this sign is positive in approximately seventy per cent of all cases. The important thing is that the poor eye can be closed without the other, but not vice versa. He would not operate this case. He had a similar case in a boy eighteen years old several years ago; the vision was poor. He operated, and obtained a vision of 15/20 in each eye following the operation.

Dr. C. E. Walker advised a patient twenty years ago with similar trouble to let well enough alone. He feels as long as the patient has good vision he should not be operated upon.

Prolapsed Iris—Iridocyclitis.

Dr. E. E. McKeown presented an Italian who showed a severe injury to left eye. He was struck in the left eye with a screwdriver from below, so as to make a horizontal linear incision about one inch long. There was extensive loss of vitreous and a large prolapse of the iris. The prolapsed iris was excised. Injury occurred a few months ago, and at the time of the meeting the left eye showed the effects of a very severe injury. Dr. McKeown has advised enucleation of the eye in this case, but this has been refused.

Discussion.—Dr. Melville Black said this eye was one of the most dangerous he had seen for a long time. He believes the eye should be enucleated at once in order to save the other.

Dr. C. E. Walker said he had advised enucleation when he saw the case in consultation with Drs. Foster and McKeown.

Prolapse of Iris.

Dr. F. R. Spencer presented B. E., aged eight years, who had both eyes injured November 3rd, as a result of applying a match to some dynamite caps. These exploded in his hands, and foreign bodies penetrated each eyeball.

His eyes were examined within an hour after the injury, at which time his right eyeball revealed a punctured wound about two millimeters from the inner limbus in the sclera. The iris had prolapsed through this wound so that the pupil was oval horizontally, much as it is now. The left cornea showed a vertical linear puncture about two millimeters from the limbus, with a cut in the iris, and the anterior chamber so full of blood the other structures could not be easily recognized.

He was immediately sent to the hospital and the prolapsed iris excised. Atropin was instilled and the child kept in bed until healing took place.

Repeated X-rays by Dr. Clay Giffin have been negative. He felt sure there must be pieces of copper in each eye, but the X-ray has contradicted this. In all probability small pieces of dirt or gravel were the foreign bodies which entered the wound. He shows now the scars of several very small wounds in the lids and one or two at other points in the sclera.

December 26, 1916, vision right eye, 6/20; left eye, 3/120. The right revealed a large floating veil in the vitreous, apparently attached to the old scleral wound at the inner limbus. The vision fluctuates somewhat, as the position of this veil obscures vision at one time and permits better vision at another. His vision improved from 6/20—1 to 6/12— with a plus 1.50 sphere combined with a plus 1.00 cylinder, axis 105°. Despite the free use of atropin in the left eye the pupil is eccentric in shape, up and in, and the iris and lens show an organized exudate, which consists of lens matter, débris, blood, etc. This eye has not done well.

(While this patient was being examined by the members, Dr. J. A. Patterson found a glistening metallic point on the veil of exudate in right eye, internal, inferior and posterior to the lens.)

Discussion.—Dr. M. Black said he had examined a man twenty-six years ago, following the explosion of a tomato can full of miners' caps. He was able to save one eye with 20/20 vision, after several months of hard work. This vision was obtained after a cataract had been removed. Several years later, while working in a hay field, the vision failed very suddenly, with extensive retinal detachment. This eye was blind after twelve years of useful vision. The first blind eye was enucleated soon after the injury.

Dr. Black also recalled another similar case which he presented before this society several years ago. One eye had to be enucleated, but the other eye was saved in spite of a metallic body in the vitreous. This could be seen as a glistening point in the vitreous for some time after the injury. Later on it dropped down into the lower part of the vitreous chamber, where it became surrounded by exudate and could not be seen with the ophthalmoscope. His vision is 20/20 today. This metallic substance is nonmagnetic.

Dr. William H. Crisp believes that the foreign body in Dr. Spencer's case moves during movements of the eye, hence it has failed to cast a shadow on the X-ray plate. The foreign body is attached in the veil of exudate, just back of the lens, and this moves freely with movements of the eye, so that the foreign body does not remain in one position long enough to cast a shadow.

Massive Hemorrhage Into the Vitreous.

Dr. Spencer presented Mrs. M. T. W., aged sixty-one years, married. First examined January 10, 1917.

She gives a history of very sudden failure of vision in right eye on December 19th. She states that she has been able to see but very little with this eye sinc that date. She thinks the left eye has been worse since that time. Vision right eye, fingers; left eye, 6/12 minus and Jaeger No. 8.

Each eyelid reveals an old cicatricial trachoma with pannus above, and old corneal cicatrices in the upper half of the right cornea. Tension, by Gradle's tonometer, is ten to eleven millimeters for each eye.

The left fundus revealed tortuous vessels, but with this exception was practically negative. The right fundus showed a very extensive hemorrhage into the vitreous, so that it was impossible to make out the details.

The blood pressure and the urine are both negative, according to her family physician.

Diagnosis.—Probably thrombosis of the central retinal vein, although the hemorrhage may have occurred from the retinal vessels without thrombosis of the central vein.

The Wassermann and tuberculin tests not made.

Discussion.—Dr. W. H. Crisp thinks this case is one of massive hemorrhages into the vitreous from some of the retinal vessels, probably from the veins, due to arteriosclerosis, as her age explains this. He does not think that this patient necessarily had thrombosis of the central vein.

Dr. John A. Donovan, of Butte, Montana, believes such cases should be given a bad prognosis, as they usually do not live very long after such an extensive hemorrhage into the vitreous. He thinks this patient may live two or three years.

Unusual Clover Leaf Cataracts.

Dr. F. R. Spencer presented Mrs. C. H., twenty-eight years old, married. First examined January 12, 1917.

Recently she has had severe headaches, her eyes tire easily and the eyeballs ache, especially after near use. She thinks this has been worse during the past year, but she has had some trouble since early childhood. She has worn lenses for a number of years. Has been told by several oculists that she has cataracts.

Vision right eye, 6/20 plus and Jaeger No. 6; left eye, 6/15 and Jaeger No. 5. Each lower canaliculus has been slit during treatment of the tear ducts.

Keratometer: Right eye, one diopter 100 plus and 10—; left eye, one diopter 80 plus 170—. Under hyoscyamin, right eye, 6/15, equals 6/12—2 with a —0.75 cylinder, axis 25°. Left eye 6/15, equals 6/15 with a —0.50 cylinder, axis 145°. The examination of the fundi revealed a three leaf clover cataract in the posterior lens cortex of each eye, with two leaves superior and one leaf inferior. The central area between the three leaves is also quite opaque, so the central vision is greatly reduced. Each disc looks red, as one would expect through hazy media. The ocular muscles are practically negative in spite of the defective vision.

Discussion.—Dr. Melville Black suggested five per cent dionin for each eye at bedtime every alternate week. He believes dionin used in this way produces better results than if used continuously, as patients do not gain so much tolerance for the drug as they do if used constantly. He believes that the central portion of the cataractous lens can be cleared, as it was formerly, and she will regain her former vision.

Dr. D. A. Strickler advised mercuric cyanid to be used almost entirely, along the lines suggested by Dr. E. L. Jones of Cumberland, Md., at the first Colorado Ophthalmological Congress.

Congenital Ptosis.

Dr. F. R. Spencer presented E. H., married, a mill man, aged twenty-seven years. First examined September 11, 1916. He gives a history of ptosis since fifteen or sixteen years of age. He thinks this has gradually increased since that time, but has been much worse for the past three years. His mother, maternal grandmother, two maternal aunts, and one brother all had similar trouble. His younger brother's lids began to droop at the age of twenty-two years. His mother had great difficulty in raising her lids.

Vision each eye, 6/60, Jaeger No. 2. The keratometer showed a diopter and a half of astigmatism, 130 plus 40— right eye, and 75 plus 165— left eye. Under hyoscyamin his vision was improved from 6/60 to 6/7.5— right eye, with a —3.00 sphere combined with a —1.50 cylinder, axis 40°; left eye with a —3.50 sphere combined with a —1.00 cylinder, axis 135°. Correction given for constant use.

The anterior segments and the fundi are negative. He usually fixes with the right eye, the left is often divergent ten or fifteen degrees. By repeated tests the divergence was found to be alternating, although the amount was fairly constant. His abduction, adduction, super- and subversion were all very limited, as was convergence. He was unable to raise either eyelid without the assistance of the frontalis muscle. He believed this a case of bilateral congenital absence of the superior rectus and the levator of the upper lid.

September 26th, under cocain anesthesia, a Tansley-Hunt operation was performed on each upper lid, with very slight overcorrection at the time.

Discussion.—Dr. Black mentioned a case he had formerly presented before this society. One eye only was operated upon for congenital ptosis by the Tansley-Hunt method. Eleven months later a cyst developed in the region of the pedicle used to draw the upper lid upward. He believed the cyst was due to a little of the skin he had left on the pedicle instead of removing it all. He made a short incision, curetted the cyst, and the patient now has a good result.

Marginal Serpent Ulcer.

Dr. H. R. Burns reported a case of marginal serpent ulcer treated by Prince's method of pasteurization. He believes this was a pneumococcus ulcer, although he did not have swabs made to prove it. The patient was sent to the hospital the day he saw the case in his office, and the pasteurization treatment was immediately used. At first there did not seem to be any improvement, but later it was very marked, and gratifying improvement followed only one application.

Dr. D. A. Strickler had the pleasure of seeing the case, and commented upon the promptness with which the ulcer healed.

Anophthalmia.

Dr. W. F. Matson reported a case of anophthalmia which was seen in consultation by Drs. Edward Jackson and C. E. Walker while the child was at Mercy Hospital.

Baby, male, born January 9, 1917. Tentatively a case of anophthalmia. Case was seen by Doctors Jackson and Walker, January 18, 1917.

Literature is extremely barren on this anomaly. Fuchs speaks of apparent anophthalmia, but always of a small eye or cryptophthalmos. Parsons, in his recent excellent and complete pathology of the eye, scarcely mentions it.

In this case no palpation or examination can detect an eye or a mass one could assume might be an eye. A short palpebral slit, six or seven millimeters long, shows cilia, both upper and lower, in both eyes. Examining the cul-de-sac by means of strabismus hooks, one sees only a pocket lined with mucosa.

Moisture was present, probably from the glands of the conjunctiva, as we are not sure of the lacrimal gland. There is a supraorbital notch in both eyes. There is no heredity traceable on either side. Both parents are well. Previous child is a girl, who is living and well.

Discussion.—Dr. Edward Jackson said this case was one of the most complete cases of anophthalmia he had seen. The orbits were very small, although the lids, cilia, and conjunctiva showed some development. He could not find any eyeball, although there were some embryonic structures at the apex of the orbit. He thinks the orbit should be examined to gratify the parents, but the patient will not be benefited by such a procedure. He thinks the superficial structures are an index of the development of the optic nerve, and since the superficial structures, such as the lids, cilia, and conjunctiva, are developed, there must be some rudimentary optic nerve.

Dr. C. E. Walker said there was not an eye in either orbit. One socket showed a purulent discharge the day he saw the case, and he was able to find the conjunctiva readily. He believed the eye would be above, as the lids were closed, and one should look upward to find the cornea, if it is present. He believes it would be wise to enlarge the palpebral slit in this case and see how much of an eyeball exists. It was possible to evert the lids a very little by using strabismus hooks. These were used by Doctors Jackson, Walker and Matson while examining this baby.

Dr. E. E. McKeown mentioned a baby, nine months old, which he has under observation, with a very rudimentary eye. He asked when the child should be given a shell eye in order to develop the orbit and face. The parents have refused any operative procedure, so it will be necessary to treat this case along conservative lines.

Dr. C. E. Walker said he would not undertake the responsibility of such a case as Dr. McKeown's, unless the parents would permit an operation or would cooperate in every way possible to obtain the best results.

Dr. Edward Jackson believed the rudimentary eyeball, in Dr. McKeown's case, will do more to develop the orbit than any artificial eye. He would not recommend an artificial eye if the rudimentary eye is sufficient to fill the orbit even partly.

Dr. F. R. Spencer said the rudimentary eye would help to develop the orbit and would act, following some modified Mules' operation, better than an artificial eye. In children it is very important to have something in the orbit to develop the orbit and the side of the face, but he does not believe in Dr. McKeown's case that an artificial eye is very necessary.

Polycythemia.

Dr. J. A. Patterson presented Mrs. H. W. H., aged thirty-eight years. Has been subject to hay fever and asthma since childhood. Was in fairly good health until about eight months ago, in Spokane, when she had an attack, accompanied by vomiting; has gradually lost thirty-five pounds in weight, with tar-like stools in this attack. The hay fever symptoms occurred regardless of season, but she has had none since July, 1915. Now suffering intensely from asthma.

Previous History.—Had measles at nineteen or twenty years of age, with no complications. Had catarrhal fever, probably bronchitis, when residing in Nebraska, with slight asthmatic symptoms, when she was nine years old. Had jaundice when fourteen years old.

Tonsils, nose, nasopharynx, pharynx and larynx all negative.

Trachea dark red, as if lining was congested.

Dr. Swan reports urine contains albumin and a few hyalin casts. Blood pressure: systolic, 200; diastolic, 140. Chest characteristic of asthma. Heart negative.

January 15, 1917. Blurring of sight of left eye noticed very distinctly six days ago, and to a less degree a week before that. Her asthma is better, now rarely bothering her. Dr. Swan reports polycythemia.

Dr. Swan reports the following blood examinations:

November 21, 1916. Hemoglobin, 120 per cent; reds, 8,896,000; whites, 24,500; red forms, negative. Differential whites: Polymorphonuclears, 70 per cent; lymphocytes, none; small mononuclears, 7 per cent; large mononuclears, 7 per cent; transitionals, 1 per cent; eosinophiles, 15 per cent.

December 28, 1916. Hemoglobin, 120 per cent; reds, 7,112,000; whites, 14,600; red forms, negative. Differential whites: Polymorphonuclears, 78 per cent; lymphocytes, 2 per cent; small mononuclears, 6 per cent; large mononuclears, 6 per cent; transitionals, 1 per cent; eosinophiles, 7 per cent.

Blood very thick, smears badly. Blood platelets negative. Wassermann negative.

Right eye: Nerve and retina normal, except that the characteristic veins, almost black in color, may be a trifle enlarged and slightly wavy. Arteries are normal, no indentations at crossings. At macula there is a glistening crystal, the underlying retina appears slightly edematous, as if early stages of Bright's retinitis.

Left eye: There is an enormous increase in the number of vessels in the nerve head, which are very wavy. There are hemorrhages everywhere, particularly nasal to nerve. In this area there is one white patch which appears as a double patch, this is one disc diameter nasal to nerve; there is another smaller white patch down and in. The temporal half of the eye ground is less involved than the nasal, which is more or less disorganized by small droplets, exudations and the patches indicating where larger masses have been. In the fovea there seems to be an appearance indicating a droplet of blood. Where the veins and nerve can be seen, the veins have the characteristic blackish appearance, and both they and the arteries are very tortuous. Characteristic picture of cyanosis of the retina from polycythemia.

Discussion.—Dr. Edward Jackson said his case of polycythemia, which he presented before the society one and one-half years ago, is doing well. This patient had a hemorrhage in one eye, but hemorrhages are rare.

Dr. Melville Black said his case had numerous hemorrhages.

Dr. Hill, who examined the blood in Dr. Black's case, told Dr. Black if the estimate were made from the blood stream, and not from the capillaries, the count would be lower, so this was done. The blood was taken from a vein, and showed only seven million reds, while the blood from the capillaries showed eight million reds. Dr. Black's patient died from valvular heart disease. However, the eyes improved greatly just before death.

Cataract Following Iridocyclitis.

Dr. G. L. Strader, of Cheyenne, presented a man who showed a cataract following an attack of iridocyclitis. This iridocyclitis was preceded by a very severe attack of "tick" fever last April. Immediately after the attack he could count fingers at eight feet. Later, a cataract developed.

Mr. S., forty-one years old, first consulted Dr. Strader August 12, 1916.

History.—Was taken sick May 20, 1916, with Rocky Mountain or "tick" fever. In bed seven weeks. Large ulcers formed on posterior surfaces of arms and legs, also on buttocks and in mouth and throat. Twenty-first day, right eye became sore, with marked pain, redness and photophobia. Attending physician made a diagnosis of corneal ulcer. After three or four days patient could not see.

At present, eyeball moderately congested. Pupil margin adherent to lens except small portion below. Pupil filled with rather dense exudate. Tension normal. Vision equals hand movements. Under heat, large doses of salicylat and atropin, improvement rather marked. One week later, vision equals fingers at four feet. No ulcer and no corneal opacity.

Returned November 5th. Lens had become cataractous. Projection fairly good. Very little irritation. Sent home with instructions to use dionin and atropin.

January 11, 1917. Eye has tendency to become irritable with moderate supraorbital pain. Tension, slightly minus. Projection only fair. Pupillary margin shows loss of pigment. A few days later, after a course of salicylat, projection much better. Tension about normal or slightly minus.

Diagnosis: Iridocyclitis and cataract as sequelæ of Rocky Mountain or "tick" fever.

Discussion.—Dr. J. A. Patterson asked if the medicinal treatment for the tick fever had anything to do with the cataract.

Dr. Strader said he did not know, but he did not think it had.

Dr. C. E. Walker said he believed the cataract was unquestionably secondary to the iridocyclitis. The cause of the iridocyclitis was, of course, more or less doubtful. He would remove the cataract and would do an iridectomy at the same time. He would not wait for all the redness to disappear, as the lens is swollen and tends to produce a prolonged congestion of the eye. He believes these cases do better if operated early rather than late, as the shrinking exudate will tend to lower the tension later on, and then an operation will not be of as much benefit as it will if done soon.

Dr. M. Black thinks the vitreous is fluid and the iris atrophic. He would not operate this case, as there will be a large amount of vitreous lost and the eye will become atrophic. He believes the eye, if let alone, will eventually undergo atrophy subsequent to the iridocyclitis. He mentioned an eye like this which he first examined twenty-five years ago. The case returned one and one-half years ago, complaining of the better eye. He was unable to use the good eye because of irritation and general symptoms of asthenopia. Dr. Black removed the blind eye and found a bone-like lens with extensive calcium deposits in the entire uvea. He presented this specimen at a meeting of this society last year for inspection of the members. He would remove the blind eye in Dr. Strader's case, as it will greatly annoy the patient, and he feels that an early enucleation will save the patient a great deal of unnecessary suffering and expense.

Dr. Walker said he has recently had such a case which was operated. The iritis was of rheumatic origin. The vision now is 20/30 after operation. He prefers to operate these cases.

Dr. Edward Jackson expressed the opinion that these were cases of endogenous uveitis. He would let the eye quiet down, and be sure that it is free from redness. He has had several of these cases under observation for years. He would at least not operate until after the eye is free from all redness. He might wait for several years before operating, unless there should be danger of the cataract becoming overripe. He believes it would be unwise to wait for overripening of the cataract.

Dr. John A. Donovan, of Butte, Montana, who was a guest of the society, said he thought the man should be congratulated upon being alive, as the disease is apt to be very fatal. He expressed the opinion that there may have been a vesicle on the cornea, such as we often see in smallpox and other eruptive diseases. He would let the eye alone and await developments. The patient should receive large doses of sodium salicylat or aspirin, as he has been on this treatment under Dr. Strader's care. Later, if necessary, he would do an iridectomy.

Dr. G. L. Strader said, in closing the discussion, that he had favored a conservative plan of treatment. The patient wanted the cataract removed. One week ago the projection was poor below, but today it is much better. The patient thinks that riding horseback on the range has affected his eye. This patient has been taking twenty grains of sodium salicylat a day.

Meeting of February 17, 1917. Dr. Wm. C. Bane presiding.

Neuritic Atrophy Due to Sinus Disease.

Dr. E. E. McKeown presented Mrs. G. M. H. Two months ago vision of the left eye began to fail, at which time she was having a great deal of pain, first in her eyes, then in top of head and back, with blurring, etc. Shortly afterwards she noticed failure of vision in right eye, and now thinks that vision is somewhat improved in the left. No increase in tension. Blood pressure, 102. Advised Wassermann test. Dr. Mitchell reported this slightly positive.

Letter from Dr. Pothiusje, as follows: Mrs. G. M. H. first came to me January 30, 1915, with a history of hemorrhage for about two months. Her physical examination was as follows: Heart negative, lungs negative, abdomen negative, reflexes negative; uterus, size of two months' pregnancy. She had appearance of pernicious anemia. Blood examination: Hemoglobin, 25 per cent; white blood corpuscles, 4,000; red corpuscles, 2,500,000. So the diagnosis was secondary anemia of chlorotic type, resulting from the uterine disease.

After treatment and rest the uterus was removed and found to be fibroid. She completely recovered. She came in yesterday, complaining of headaches, nervousness, and decreasing vision. Vision about 1/10 minus each eye. Her physical examination and urine are negative. I wish to call your attention to a thickening of the skull in the anterior portion of the median line, and to her eye condition. She is wearing a pair of glasses fitted by a specialist in Miami, Florida, five years ago. Right eye is plus one with a plus two scale; left eye is plus 1.25 with plus 2.50 scale.

February 15, 1917: Vision equals fingers at two feet each eye; no change in fundi. Blood pressure, 102. Tension of each eye is 26 to 28. Teeth are bad. Advised that an X-ray be taken.

Discussion.—Dr. W. A. Sedwick thinks the teeth should be examined by the X-ray in Dr. McKeown's case.

Dr. Wm. H. Crisp expressed the opinion that the X-ray should include the accessory sinuses, in order to be more thorough.

Dr. D. H. Coover expressed the opinion that the vessels were a little more tortuous than normal, but otherwise he found very little evidence of pathology in the fundi.

Dr. H. H. Stilwill asked if this patient had been hysterical.

Dr. McKeown said she has not been.

Dr. E. E. McKeown stated that the blood Wassermann was positive, and the spinal fluid Wassermann was negative.

Dr. Melville Black stated the fields should have been taken early in this case, and the blind spot measured very carefully at that time. He thinks this is a postneuritic atrophy, probably due to accessory sinus disease.

Dr. F. R. Spencer expressed the opinion that the fields should have been taken early in this case, and the blind spot measured, too, as Dr. Black suggested. He also quoted from Verhoeff, that many of these cases may not show any cause for the disease, even when examined very thoroughly by competent specialists in other fields of medicine. The most exhaustive examination will not always prove of benefit to the patient.

Dr. Wm. H. Crisp asked Dr. McKeown regarding the projectile vomiting, frequency, etc.

Dr. McKeown said she had had such vomiting only a few times.

Dr. Wm. C. Bane advised X-rays for the accessory sinuses and teeth.

Dr. McKeown said she had suffered from very severe pain at times.

Dr. Crisp thought the cupping slightly increased, but physiologic, nevertheless.

Dr. George A. Moleen, a neurologist, had examined the case, at the suggestion of Dr. McKeown, but his examination was practically negative.

Dr. McKeown reported that the sphenoidal sinuses were clouded by X-ray examinations in the male patient which he presented at his office when the Colorado Ophthalmological Society met there in December. He stated that Dr. Robert Levy had operated upon the sphenoidal sinuses with very decided improvement in the patient's vision.

Laceration of Cornea—Prolapse Iris—Infection.

Dr. Melville Black presented Mr. F., occupation railroad engineer, thirty-seven years old. Left eye injured December 16, 1916, by a flying piece of glass from the bursting of an oil gauge on his engine.

I saw him about five hours later. The cornea was split from nasal limbus to its center, iris was entangled in wound. Lens appeared clear and the eye looked good. The entangled iris was pulled out and excised, leaving a good coloboma under the wound with no remaining adhesions. Atropin was instilled and the eye closed. It was not opened for two days when, to his surprise, a picture of extensive deep infection was presented. The wound was clean, the anterior chamber reformed and half full of yellow pus. He at once injected, subconjunctivally, thirty cubic millimeters of a 1/1,500 solution cyanid of mercury, which caused a most violent reaction, but stopped the progress of the infection at once. Resolution was slow, but a few days ago he thought the eyeball was saved, notwithstanding the iris was adherent to the lens, the coloboma filled with exudate, and the lens partly opaque. The tension was slightly elevated, but the eyeball was not tender. Yesterday morning the patient came in to tell him the eye had watered all night and was quite uncomfortable. He found the anterior chamber filled with blood and the tension sixty millimeters Hg. He was directed to use hot fomentations ten minutes out of every two hours.

Dr. Black: I saw him this morning and found the blood in anterior chamber unchanged in appearance. Tension, fifty millimeters Hg. He has light perception.

Discussion.—Dr. W. H. Crisp thinks the hyphema in this case of Dr. Black's does not necessarily influence the prognosis.

Dr. D. H. Coover, however, thinks he has not seen persistent hemorrhage in the anterior chamber except in cases of injury to the ciliary body. He believes this eye will improve slowly, and he would not enucleate.

Dr. W. H. Crisp, in the discussion of Dr. Black's case, reported a case of his own, in which an engineer had tapped a steam pipe while making his rounds. One of the steam pipes exploded when he struck it with a hammer, blowing many pieces of iron rust into the cornea, ocular conjunctiva, lids, etc. Some of these were rather deeply imbedded in the sclera. When he first saw the patient he removed all the pieces of iron rust, etc., from the cornea, but, considering the length of time it consumed to take care of him, he did not remove all the pieces from the sclera of each eye. The fundi were not examined because of the irritation, photophobia, lacrimation, etc.

Dr. Crisp saw this case only in consultation. A few days later the right eye became very uncomfortable. It became entirely blind in a short time, although this eye was being cared for by a general practitioner, who does some eye work. The X-rays, however, were negative. He was unable to obtain any fundus reflex in the right eye. By transillumination he found a mass in the vitreous attached to the lower part of the ciliary body. He thinks this was, in all probability, due to a massive hemorrhage into the vitreous. Dr. Crisp added that the vision improved in his case as the exudate shrank.

Dr. Wm. C. Bane asked Dr. Black if glass could be in the eye.

Dr. Black replied that the X-ray examination was negative, although we all realize how difficult it is to get a shadow of glass. He stated the eye had been entirely quiet for one month prior to the appearance of the blood in the anterior chamber.

Dr. F. R. Spencer mentioned a dwarf, whose eye was injured by the exploding of a glass water gauge, ten or eleven years ago. X-rays failed to show any glass in this eye, but he felt that, in all probability, a piece of glass had entered the vitreous chamber, from the appearance of the wound, etc. The eye improved rapidly following the excision of the prolapsed iris, and the wound closed. The eye was free from redness, and had reasonably good vision when this patient was last seen, but he felt the eye would very likely be lost subsequently from contraction of the exudate in the vitreous and atrophy of the eyeball. The patient has disappeared from Boulder, and he does not know the outcome of the case.

Uveitis.

Dr. Melville Black presented a second case, Mr. McG., aged forty-two years. Right eye injured ten years ago, which left a corneal scar with damaged vision. This eye gave no trouble until January 11th, when it became inflamed. He saw his physician, who instituted treatment. The eye was very painful and soon became almost blind. I saw him on February 12th. The tension was sixty millimeters Hg. with Gradle's tonometer. Eyeball very red. Cornea hazy with very active descemetitis, aqueous murky, entire pupil margin adherent to the lens.

Diagnosis: Uveitis.

Treatment: Subconjunctival injection of twenty-five minims 1 to 2500 solution cyanid of mercury containing one-third grain novocain and one-one-hundredth grain atropin. The reaction was very severe with resulting dilatation of pupil, clearing of aqueous and cornea, and reduction of tension. This man denies all venereal infections, and no opportunity for infection. He has a good set of teeth, except for some pyorrhea. No other pyogenic foci can be found. General health is good. He is now on atropin locally, and five grains of potassium iodid three times a day, internally.

Discussion.—Dr. D. H. Coover thinks an optical iridectomy is desirable in this case, and, if it were his case, he would perform one. He thinks the vision will be improved. He also believes this will hasten the maturity of the cataract. He would do a cataract operation later, after a preliminary iridectomy, and after seeing what effect the iridectomy has upon the eye.

Dacryocystitis.

Dr. Melville Black presented a third case, male, forty-nine years old. He has had double dacryocystitis for many years. He was under his care in 1908, for an abscess of the cornea of right eye from the infection of a small wound of cornea by a foreign body. A central leucoma formed, similar to that now seen on left cornea. Last March he sustained some slight injury to cornea of left eye, and a corneal abscess resulted. He was treated by another oculist, with the outcome of a central leucoma adherens about six millimeters in diameter. The lens is partially opaque, and there is a dark pigmented opacity in nasal side of lens which lies under the iris. It looked like a foreign body, but X-ray plates show that it is not.

Last summer an iridectomy was performed, by an oculist, upon his right eye, after the leucoma formed on left, but it was a failure, and left the eye in such an irritable condition that he enucleated it about two months ago.

He has been endeavoring to get the lacrimal passage of left eye in shape for an iridectomy on that eye. He first performed a dacryocystorhinostomy through a skin incision into the sac. But the upper end of the sac must have been injured by the manipulations, for in a short time drainage stopped, and it was found that small probes could no longer be passed into the sac. He then opened up the sac again and destroyed it with trichloracetic acid. Therefore, at the present time, the lacrimal passage may be excluded as a cause for infection if an iridectomy is performed.

Discussion.—Dr. D. H. Coover asked if the vitreous were hazy in this third patient of Dr. Black's. He mentioned an article in the January number of the *British Journal of Ophthalmology,* concerning the administration of one to two per cent potassium chlorid, subconjunctivally, for clearing up vitreous opacities.

Dr. F. R. Spencer asked if there was a possibility of tuberculosis of the ciliary body in this case, as Dr. Black had spoken of the lardaceous deposits upon Descemet's membrane.

Dr. Black replied in the negative.

Exophoria Due to Muscle Operations.

Dr. H. R. Stilwill presented J. W. C., twenty-six years old, a cigar clerk, of good habits. One year ago he came to Colorado for his health, which is now fair. Four years ago had an operation for internal squint of the right eye. The internal rectus of the eye was cut at this time. Three months later right eye was straightened by cutting the internal rectus. Later the external rectus of the left eye was cut and tucked. Six months later another oculist cut the internal rectus of each eye, and later tucked the internal rectus of the right eye.

He first had an esophoria of twenty degrees, and, after these operations, he had an exophoria with crossed diplopia. At the present time he has twelve degrees of exophoria, drawing and nystagmus are worse. Vision in right eye, 4/15 partly; left eye, 4/10. Glasses do not improve this. When his eye is not fixed, or when relaxed, he has a lateral nystagmus. Headaches and fullness over occiput. When trying to suddenly fix for distant vision, vertigo results, and this is his chief complaint. Diplopia at times. Patient wants his right eye removed or blinded, although it has been under atropin for the past month with some slight relief of symptoms.

Discussion.—Dr. M. Black said this case illustrated the error of muscle operations in neurotic individuals.

Dr. W. H. Crisp stated that this patient should be very carefully and properly refracted, and then the oculist should insist upon his wearing the proper correction. If he will persevere with his lenses, he will obtain lasting results.

Dr. H. R. Stilwill said he would have to be very firm with this man or let him seek advice elsewhere, as he is too unwilling to wear the lenses simply because he is uncomfortable with them on.

Dr. E. M. Marbourg referred to a suit in which the physician should have used this method. Instead, he had removed an eye because the patient wanted it done, and the judge held him liable for doing something which he knew should not have been done, and which he should not have consented to do simply because the patient wanted it done. He stated that, in Dr. Stilwill's case, the patient's request should not be granted.

Dr. Black said this may be a case of alternating squint with good vision in each eye, and that a muscle operation could not do any particular good.

Dr. W. C. Bane asked if this patient has any central defect.

Dr. Stilwill answered in the negative.

Dr. Stilwill said this patient is very ambitious and anxious to advance in the world, but, because of his eye trouble, he feels that he cannot. He believes this man is very liable to commit suicide and, therefore, needs a great deal of advice and careful observation.

Dr. M. Black said he should have weaker lenses, and these should be gradually increased from time to time until he is able to wear his full correction; that he should be made comfortable, otherwise he will not cooperate with any oculist.

Dr. C. A. Ringle said he should not wear a full correction, but should lead an outdoor life and have good food, so that he will improve. Indoor life is not best for such patients.

Tumor of the Optic Nerve.

Dr. Wm. C. Bane presented Master L. B., aged nine years, who was shown at the November meeting of this society, with a marked proptosis of the left eyeball, it being pushed forward, downward, and inward. At that time the anterior surface of the left eye protruded five millimeters more than the right, and the cornea was lower by five and one-half millimeters. The X-ray showed no bony tumor, and a tentative diagnosis of tumor of the optic nerve was made, and operated upon December 5, 1916.

Removal of any of the bony wall of the orbit proved to be unnecessary, and elevation of the conjunctiva and severing of the external rectus muscle soon brought into view a cyst about the size of a hazelnut. It was attached firmly to the eyeball, near the nerve, and to the outer side of the nerve near the eyeball. In trying to shell the cyst out, it was ruptured, and clear straw colored fluid escaped.

The section of the nerve with the cyst wall attached was then removed close to the eyeball, and turned over to Dr. W. C. Finnoff for pathologic examination. He will report his findings. Dr. Bane endeavored to remove all of the cyst wall.

Since operation the eye has retracted considerably, and the muscles have regained some of their power. There has been a good deal of swelling on the temporal side of the eyeball, which has neither increased nor diminished in size during the last two months. It may be some reaccumulation of cystic fluid, but no investigation has been made.

Discussion.—Dr. Bane stated that one or two ulcers developed near the outer limbus, from exposure of the cornea following the operation. These healed promptly, after the eye was bandaged, but had some tendency to recur. However, he has been able to get these to heal without any serious injury to the cornea.

Dr. Wm. C. Finnoff gave the following report of the examination: The optic nerve measured eight millimeters long, and there was a cyst attached to the nerve, lined with several layers of neuroendothelium. This extended from the anterior to the posterior end of the nerve. The nerve was very atrophic. He thinks the endothelium must have been at least six or seven cells thick. A section of the specimen was sent to

Dr. F. H. Verhoeff, of Boston, and to Dr. Marcus Feingold, of New Orleans. Dr. Verhoeff said the tumor extends farther back than this specimen shows. The diagnosis is cystic degeneration of an edothelioma.

Dr. M. Black said the circulation in the retina was very good, in spite of cutting the nerve off close to the globe. He was unable to explain this, but called the attention of the members to the good circulation. Dr. Black said his pressure test failed to exsanguinate the retinal vessels.

Dr. W. H. Crisp said, before hearing Dr. Finnoff's report, he thought this was a case of early tumor of the optic nerve. He thinks, however, this may be part of another tumor farther back along the optic track.

Dr. W. C. Finnoff said Dr. Verhoeff had looked over his tumors of the optic nerve, when he received this specimen, and said there was a decided thickening of the neural endothelium in cases of tumors of the optic nerve.

Dr. W. H. Crisp mentioned the fact that Dr. Casey A. Wood removed the tumor, without removing the eye, in his case of tumor of the optic nerve.

Dr. W. C. Bane asked if the swollen conjunctiva at the outer canthus means anything.

Dr. Black answered in the negative. He said this is an edema, pure and simple, following section of the external rectus muscle in order to turn the eyeball forward to remove the tumor of the optic nerve.

Melanosarcoma at the Limbus.

Dr. E. M. Marbourg mentioned a case seen with a colleague, who had been struck at the limbus with a piece of coal. The case was shown before this society several years ago. A piece of coal was removed, but there was quite a little pigment at the limbus. This pigmentation aroused suspicion, and a section was removed and examined by a pathologist. However, he reported an absence of melanosarcoma. This eye was enucleated later in Denver. Two years after the enucleation the patient developed abdominal pain in the liver region, followed by death. The cause of death was metastatic sarcoma of the liver, secondary to the melanosarcoma of the eye. He also mentioned the fact that many laborers handle a great deal of cyanid of sodium and potassium in hardening steel. Blindness may occur, and he thinks we should watch the laborers who have occasion to handle a great deal of iron for this.

Discussion.—Dr. W. C. Bane reported a case which he presented several years ago before this society, of melanotic sarcoma of the eyeball. The eye was enucleated, but death occurred two years later. Doubtless the death was due to metastatic sarcoma, but he could not obtain a postmortem, and so was unable to prove this.

Dr. W. C. Finnoff said any tumor which gives evidence of being a sarcoma should be removed very early, and, if the eyeball is involved, the eye should be enucleated very thoroughly, as sarcomata usually metastasize very early. Most of these are melanosarcomata, although a leucosarcoma is rare. Melanin will be present in some parts of the tumor, if we search for it carefully, although some of the sections may lead us to believe that it is a leucosarcoma.

Dr. F. R. Spencer called attention to the fact that, while some of these cases live a long time after a diagnosis of melanosarcoma is made, it is the exception for them to live very many years. He referred to a case which Dr. Hans Lauber used to show in the eye clinic in Vienna, which he saw five and one-half years ago. At that time this patient, a lady, had a melanotic sarcoma of the optic nerve head of one eye for some twelve or fifteen years, with no evidence of metastasis. However, such prolonged cases do not demonstrate the wisdom of waiting. This woman had been advised to have the eye enucleated, but had refused all operative interference. He stated that, personally, he would prefer enucleation, if his own eye were involved with a melanotic sarcoma.

Dr. D. H. Coover said he had in mind two cases in which he had enucleated an eye for a sarcoma of the choroid. One of these he operated on twenty-five years ago, and another fifteen years ago. Both are now living and well, as he has seen both of these patients recently. In both of these cases the pathologist reported a melanosarcoma.

Foreign Body.

Dr. Wm. C. Bane presented Mr. C. S., twenty-two years old. September 9, 1916, while hammering on a vise, the patient felt something strike the left eye, but was not certain whether it hit the lid or the eyeball. No pain, no sensation of a foreign body in the eye, but merely a slight discoloration of the conjunctiva on the temporal side. Vision was good with each eye. Ophthalmoscopic and sideroscopic examinations were negative at this time, and it was hard to believe there was any foreign body in the injured eye. An X-ray examination was urged, in order to be on the safe side. This showed a very small foreign body eleven millimeters back of, seven millimeters below, and five millimeters to the temporal side of the center of the cornea. Another examination with the sideroscope was then weakly, but definitely positive, showing that the foreign body was a fragment of steel.

September 22, 1916, the foreign body was removed with the hand electromagnet, through a scleral incision. Recovery was uneventful, and vision has remained better than normal.

Tuberculosis of Retinal Vessels.

Dr. Wm. C. Bane presented a third case, Mr. S. B., twenty-two years old, who came to his office, January 25th, complaining of poor vision in the right eye, which had existed for about three days. First noticed it on arising in the morning. He thinks he had a similar attack about two months previously, which lasted only about an hour.

Other History.—Says he has nosebleed quite often. Has tonsillitis about once a year, and has just recovered from an attack. No history of tuberculosis.

Examination revealed several hemorrhages into the vitreous, one a small dark spot, centrally located, a central semitransparent cloud about three discs in diameter, a flat cloud hemorrhage in the temporal field, and a similar one in the nasal field. Vision right eye, 5/15—; left eye, 5/5—.

Treatment.—Ten grains of potassium iodid three times a day, increasing.

February 1st, the vision had improved to right eye 5/6+. The vitreous was much clearer. Very little headache. February 3d, vision again hazy. Right eye, 5/20. Complains of some headache. February 9th, right eye, 5/15. Was able to see the disc by indirect method, but indistinctly. Bleeding spots on the right side of the septum touched with silver nitrat.

Ordered ten grains of calcium lactate before meals, and reduced the iodid to ten drops after meals. February 16th, vision entirely blurred for letters. Asked for von Pirquet and tuberculin tests.

Discussion.—Dr. W. C. Bane said he usually gives potassium iodid to cases of vitreous hemorrhage.

Dr. M. Black asked if he had had hemorrhages before.

Dr. Bane answered in the negative. He stated that tuberculin tests and the Wassermann are being made. The patient has had tonsillitis about once each year, and had had one attack just preceding the eye disease.

Dr. H. R. Stilwill says he has cured a vitreous hemorrhage completely with potassium iodid.

Tuberculosis of the Conjunctiva—Not Parinaud's Conjunctivitis.

Dr. D. H. Coover mentioned a case of Parinaud's conjunctivitis shown several months ago before this society. A portion of the conjunctiva was removed for pathologic examination by Dr. Finnoff, and it was found to be tuberculosis of the conjunctiva.

Discussion.—Dr. W. C. Finnoff said the first section did not show tuberculosis, but a larger section did enable him to demonstrate tubercle bacilli in the tissue.

Dr. W. H. Crisp complimented Dr. Finnoff upon finding any tubercle bacilli in the tissue, as this is not always an easy matter.

Dr. W. A. Sedwick reported that the X-ray had confirmed the right sided tumor of the pons, in the brain tumor case which he had presented before the January meeting of this society.

Dr. M. Black thinks the iodid would not help cases of vitreous hemorrhage, as they clear up even without potassium iodid.

Dr. W. H. Crisp said potassium iodid may produce hemorrhage into the vitreous of tuberculous patients, and it may be best not to give it to them.

Dr. Bane expressed the same opinion.

Doctors Black and Coover referred to a young lady with recurrent vitreous hemorrhage. This woman was formerly a patient of Dr. Black's.

Paralysis of External Rectus.

Dr. W. H. Crisp reported a case of abducens paralysis in a man of thirty-seven years. Ten days before coming for examination, a convivial evening with excessive drinking had been followed next morning by a spell of vomiting with sudden pain in the left side of the head and subsequent violent headaches and general lassitude, which had been diagnosed by a general physician as an attack of grippe and treated with quinin. A week after the attack of vomiting the patient began to see double. The case was apparently a straightforward one of paralysis of the left abducens, the fundus and vision being normal, and the only other symptom an aching of the back and left side of the neck. There was a history of a primary sore four years previously, and of treatment with one dose of salvarsan and subsequent inunctions. The Wassermann test had been negative on several occasions. During the two weeks since the first visit, the patient had been under mercurial injections intramuscularly, and there had probably been a slight improvement in the motility of the left eye. The patient's muscular reflexes and coordination were normal.

Discussion.—Dr. E. M. Marbourg asked if the luetin test had been made.

Dr. Crisp replied that it had not.

Dr. M. Black said this patient may have a neuritis or beginning tabes from lues. He thinks this case should be seen by a neurologist. The external rectus paralysis is often the first symptom of a multiple sclerosis.

Dr. W. H. Crisp said there had not been any improvement in the paralysis in two weeks.

Dr. D. H. Coover and Dr. Sedwick advocated the inunction form of treatment.

FRANK R. SPENCER,
Secretary.

COLLEGE OF PHYSICIANS OF PHILADELPHIA, SECTION ON OPHTHALMOLOGY.

Meeting held April 20, 1916. Dr. S. Lewis Ziegler, chairman.

A Case of Microphthalmos With Orbital Cyst.

Dr. William Zentmayer presented the case of E. R., aged seventeen years. He was born with the present condition of the left eye, except that the swelling about the eye has increased since the twelfth year. No other member of the family was similarly affected.

There was a swelling of the lower lid, with ectropion. A tumor mass, about the size of a small walnut, and apparently globular, could be felt through the lid. It seemed to be anchored toward the temporal side, and was but slightly movable. There was ectropion of the lower lid, of such a degree that the cul-de-sac was obliterated. The conjunctiva was thickened. In the upper inner portion of the orbit there was a small rudimentary globe. The cornea was about four millimeters in diameter. The globe had limited movement in all directions but downward. X-rays did not show the cyst. In the right eye there was a partial coloboma of the optic nerve. The excavation involved all but a narrow rim of the papilla above, and at the lower margin the inferior artery and vein emerged through a narrow bridge of glial tissue. The vessels entered the disc at the upper inner third. The bottom ot the excavation was —3 D. The fundus was level and slightly hyperopic. Since the case was exhibited, it has been operated upon and the diagnosis confirmed.

Neuroretinitis Following Removal of the Thyroid Gland.

Dr. Frederick Krauss presented a case of neuroretinitis following the removal of a goiter from a twenty-four-year old man. The patient claimed to have had perfect vision and good health previous to the operation. He had failure of vision and symptoms of tetany several days after that procedure. It had been three months since it was undertaken when the patient was exhibited.

There was marked choking of the disc, the swelling in the right eye being +4 D.; and in the left eye, +5 D. There were no hemorrhages. The vision was normal in the right eye, and nearly so in the left. The field for white was heavily cut in both eyes; the color field only slightly cut. The patient was very nervous, irritable and depressed, on account of transient attacks of amblyopia. He improved considerably after the administration of thyroid extract, showing the toxic nature of the lesion.

Discussion.—Dr. de Schweinitz, discussing Dr. Krauss' case, inquired in regard to the character of the periods of temporary amblyopia, and referred to this important sign of increased intracranial tension in brain tumor, due to the pressure of a distended ventricle upon the underlying chiasm.

Dr. Holloway stated that he felt sure that Dr. Krauss must have considered the possibility of the operation interfering with the equilibrium of the internal secretions. He thought that this etiologic factor should be borne in mind, especially when one considers the intimate relation existing between the thyroid and the pituitary body, and the relation between the thyroid and the pancreas and adrenals. He still further stated that a functional relation existing betwen the parathyroids and thyroids and the kidneys has been shown experimentally.

Ligation of the Ophthalmic Vein for Exophthalmos.

Dr. Frederick Krauss exhibited a patient who had been operated upon successfully for exophthalmos due to orbital aneurism. The primary operation had been ligation of the ophthalmic vein by the supraorbital route. The pulsation and bruit then disappeared for two weeks, following which there was recurrence of the pulsation upward and inward from its former location. The exophthalmos was diminished markedly.

There were frequent attacks of bleeding from a small sinus at the upper inner angle of the orbit, apparently occurring and stopping without cause, for which the common carotid was tied.

The blood pressure was reduced from 215 millimeters to 150 millimeters, probably due to the bleeding. There were no complications. The exophthalmos had disappeared, and there was no pulsation nor bruit. The ocular movements were good.

Disseminated Choroiditis.

Dr. T. B. Holloway exhibited a boy, aged thirteen years, who was first seen in the service of Dr. de Schweinitz, at the University Hospital, on March 13, 1916, when his eyes showed the following conditions:

The vision of the right eye was 6/12; and of the left, 6/15. In the right eye there were a few vitreous opacities. The disc, of rather mellow appearance, was pinkinsh yellow in tint. Studding the choroid were innumerable lesions, varying in size from a split pea to half the disc's diameter. Many of these presented a grayish white, cotton-like appearance, and were surmounted centrally or eccentrically by a ring of pigment having an apparent diameter of about four millimeters, the circumference of the lesion not being pigmented. In a few instances the pigmentation consisted of a solid clump, of about the same size as the rings. Some of the lesions were of a yellowish tint; and one, near the macula, was without pigmentation, whitish in color, and surrounded by a narrow yellowish areola. In a few instances the retinal vessels were partially covered by pigment. In the left eye there were a few vitreous opacities, with a low grade neuritis, and a diffuse superficial retinochoroiditis, most perceptible in the macular region; and in the periphery there were a few vague choroidal foci without pigmentation. General examination revealed slight enlargement of the cervical lymph glands, some enlargement of the tonsils, and a suggestion of a rachitic rosary. The Wassermann test was positive.

Dr. Holloway stated that he had never before seen a case quite as striking as the one under discussion. He believed that the condition presented various stages of an active process depending upon hereditary lues.

Pulsation of the Retinal Arteries.

Dr. T. B. Holloway stated that the two patients showing pulsation of the retinal arteries from cardiac and vascular disease were exhibited because he thought that ophthalmologists see fewer instances of this phenomenon than is commonly believed. He stated that this condition could be studied beautifully by means of the Gullstrand ophthalmoscope, as was done in one of these patients. He referred to the various conditions under which pulsation of the retinal arteries could be observed, as described by Parsons and Gowers.

The first case had been referred to Dr. Sinkler's clinic at the Orthopedic Hospital and Infirmary for Nervous Diseases, by Dr. Hooker. There existed an aneurism and a double aortic murmur, as well as a left-sided hemiplegia. The Wassermann test was positive. The second patient was a young girl who had come under observation in the service of Dr. de Schweinitz at the University Hospital, and had mitral and aortic disease dependent upon rheumatism.

Discussion.—Dr. Zentmayer said that sometimes it is very difficult to be sure of the presence of an arterial pulse. Haab points out that it is important that the patient, the ophthalmoscope, and the observer's eye be absolutely steady; as the gentle pulsatory movement of the patient's body, or of the arm of the observer, may imitate a slight pulsation. He advises that the patient be seated with the arms upon a table, and that the surgeon also have a rest for his arm. He thinks that through the medium of "autosuggestion" there is also danger of seeing pulsation when it is not present. Dr. Zentmayer recalled a case seen in consultation, in which a pin point corneal opacity gave rise to the impression of an arterial pulse. The slightest movement of the mirror alternately brought the artery into view and obscured it, and it was only after careful study that the explanation of the phenomenon was reached.

In closing, Dr. Holloway stated that the phenomenon that Dr. Zentmayer had referred to had been observed in the first patient; and that when the examination was made it had been necessary for him to support the arm, as for some reason there had been a distinct diminution in the amount of pulsation. He regretted to say that he had not examined the cornea with a loupe for a possible faint nebula.

Extensive Epithelioma of the Lids Treated by Curettement and Radium.

Dr. T. B. Holloway exhibited an Italian, aged about fifty years, who was first seen at the Polyclinic Hospital on March 25, 1915. The patient had a large epithelioma about the internal canthus, involving the inner portion of both lids. It had begun as a small papule on the lower lid, four years before, and had not received treatment for three years. Beginning at the middle of the lower lid there was an ulcerating area, the size of a five-cent piece, that extended inward to the inner canthus. A somewhat similar but smaller area involved the inner portion of the upper lid, the two being connected by a narrower tract, extending deeply at the internal canthus, and involving the lacrimal sac. From the inner margin of the lower lid a flap-like mass of epitheliomatous tissue extended upward, partially covering the inner portion of the globe. The patient was not seen again until four weeks later, when the lesion had much enlarged; and he then consented to operation. An extensive curettement of the whole epitheliomatous mass was done, necessitating deep excavation into the orbit. After the application of pure carbolic acid, a moist dressing was applied. The result of this was most satisfactory, the upper area filling in with a barely perceptible scar. Three months later a recurrence at the lower orbital margin necessitated another curettement; and owing to a recurrence at the outer portion of the lower lid, a third curettement was done on February 23d. Since the second operation three applications of radium have been made by Dr. Pancoast, with little or no reaction and very satisfactory results. At the present time the eye is quiet, and only about five millimeters of the outer extremity of the lower lid remains.

Discussion.—Dr. Zentmayer said that in his experience the results obtained from the "desiccation treatment," as done by Dr. W. L. Clark, had been so satisfactory from every point of view that other methods of treatment, including plastic operation, had been abandoned, except when the destruction of tissue was extensive at the time the case was first seen. He believed that his experience was in agreement with that of his colleagues at Wills Hospital.

Dr. de Schweinitz, discussing Dr. Hollaway's paper, described a patient with epithelioma that had partly destroyed the outer commissure and the lower lid, and had extended inward at the inner angle of the orbit. Pain was severe. The eyeball, which was beginning to become epitheliomatous in its lower area, was enucleated; but complete evisceration was not performed, only the evidently epitheliomatous tissues being excised. One treatment of radium (fifty milligrams) for four hours, was followed by very rapid cicatrization and complete relief from pain. A few weeks later a small area of breaking down tissue at the inner and upper angle of the orbit appeared. This was quickly corrected by a second application of radium. Some months have now elapsed, and there has been no recurrence.

A Case of Round Celled Sarcoma of the Choroid.

Dr. Edward A. Shumway reported the case of a man, aged fifty-two years, in whom the first microscopic sections showed an isolated round nodule, lying between the thickened detached retina and the lens, and composed of nonpigmented round cells, of the same size as the nuclear cells of the retina. There was necrosis of a considerable part of the tumor, leaving well-staining mantles of cells surrounding the blood vessels, as in glioma; and the growth had the appearance of having sprung from the retina. Further sections of the other half of the eyeball, however, showed the tumor to have sprung from the choroid, and to be, in reality, a round celled leucosarcoma of this tunic.

A Case of Pituitary Body Struma, With Special Reference to the Visual Field Phenomena and the Effects of Organotherapy.

Dr. G. E. de Schweinitz and Dr. H. W. How detailed the clinical history of an unmarried woman, aged fifty-one years, whose occupation was that of a tuberculosis dispensary nurse. There was nothing of importance in her family or her previous medical history, except that after a prolonged siege of nursing she broke down nervously and lost flesh rapidly—as much as thirty pounds. Later, after retiring from this work, the lost weight was regained. Menstruation had been established at the age of fourteen years, and always occurred in association with intense pain. Since her forty-ninth year there had been no regular period, and none during the last year. Always, even from early life, she had intense headaches, sometimes neuralgic in type, which were unaffected by any ordinary treatment. She had had much rheumatism. Her mother had been a victim of rheumatoid arthritis. In childhood convulsions occasionally occurred; and in recent times much numbness in the hands, which was present in all of the fingers and in the thumb of the left hand.

Her eyes had been under observation for fifteen years, and during that period of time had never shown any pathologic condition until early in June, 1914—headaches at that time being very severe—when she complained of blurred vision in the right eye, which previously had always been normal. Right eye, 6/60; left eye, 6/9; marked pallor of the optic discs. Visual field examination demonstrated bitemporal hemianopic scotomas; and X-ray examination, the typical picture of enlarged sella, suggesting the presence of pituitary body neoplasm or struma. Gradually the vision of the right eye began to improve; but the vision of the left eye deteriorated until, nine months after she had first come under observation, the visual power had dropped to 4/150. The visual power in the right eye never dropped below 6/60. The visual field defect of each eye continued to increase until there was well marked bitemporal hemianopsia.

The patient declined operative interference, and was placed upon tablets of thyroid extract and pituitary body extract (two and one-half grains each). At the time of the report she had taken about fourteen hundred of these tablets altogether; therefore, about seven thousand grains of the medicine, from about July 1, 1914, to February 24, 1916. A series of visual charts covering this period of time were exhibited, showing the gradual development of bitemporal hemianopsia from paracentral scotomas, and the gradual return of the visual field, chiefly from below upward, until the visual fields were restored practically to their normal extent, and the vision of the right eye was 6/5, and that of the left eye was 6/12. Headaches and other symptoms had practically entirely disappeared.

The author referred to another case, which one of them (Dr. de Schweinitz) had already placed on record, namely, that of a patient, aged thirty-nine years, with tumor of the pituitary body, as demonstrated by the X-rays; with complete blindness, lasting twelve days in the right, and six weeks in the left eye; with complete restoration of the vision of the right eye, and nearly complete restoration of the vision of the left eye, under the influence of large doses of thyroid extract associated with inunctions of mercury. Whether in the last-named case the mercury had had any influence or not was uncertain. Syphilis was not present; at least, the tests failed to show its existence. In the first case, however, the good result followed the use of thyroid extract and pituitary body extract, without the addition of the mercurial treatment.

Discussion.—Dr. Holloway stated that he recalled very well the two most interesting cases that Dr. de Schweinitz had referred to, and was quite in accord with him in regard to the importance of this early obscured or hazy vision. He then referred to a patient in his own practice in whom this was the only symptom complained of, and in whom the fields showed characteristic changes for colors in the upper and outer quadrant, which constituted more of a hemianopic than a quadrant defect, with a retained island for blue in the left field, which subsequently disappeared. Later, an island for blue developed in the right field; whether this was an indication of a partial return of the field, it was too early to say. Dr. Holloway thought that there were enough cases on record to justify the routine use of organotherapy in selected cases. He then referred to persistent photophobia in a case of pituitary body disease, which had remained constant, even after several operative procedures. It was interesting to note that in this case there never had been any intraocular changes, aside from hyperemic discs and full retinal veins. There were no field changes, aside from slight contraction of the form and other fields. Dr. Landon, who performed the autopsy on this patient, found that the chiasm was lying much farther back than was normal, and that the optic nerves were not apparently attenuated. This case belonged to those few cases on record in which the growth was anterior to the chiasm.

Orbital Cellulitis With Optic Neuritis.

Dr. Ernest B. Mongel (by invitation) reported the case of a young man, aged twenty-three years, who had had an attack of influenza, February 5, 1916. Four days later his right eye began to trouble him. The condition, according to the patient's description, was a catarrhal conjunctivitis. It became progressively worse, and he was sent to Philadelphia and was admitted to Dr. S. D. Risley's service at the Wills Hospital on February 21, 1916. Vision on admission to hospital: Right eye, 20/200; left eye, 20/20. In the right eye there was intense chemosis and edema of the conjunctiva of both eyelids, and thick folds of swollen and edematous conjunctiva of the lower half of the globe filled in and protruded from the interpalpebral fissure. All the tissues surrounding the eye were hard. There was a proptosis of the right eyeball, downward and outward, of about ten millimeters. The lids could not be everted. There was an absolute suspension of all the ocular movements. The cornea was clear, and the anterior chamber of normal depth. The iris was negative. The pupils were equal, round, four millimeters, and responded promptly to light and accommodation. The tension was normal. The media were clear; the fundus vessels full; the veins, dilated, dark, and somewhat tortuous. The nerve head was hyperemic; the edges, very blurred; the margins, swollen about 6 D.—a typical picture of optic neuritis.

Left eye: Anterior segment normal. Media clear. Fundus negative.

The patient was put at absolute rest in bed, and given free elimination and tonics, with constant cold compresses to eye and atropin locally in eye. After a few days, during which there was very little pain and tenderness, and less than one degree rise in temperature, the swelling of the tissues gradually lessened, as did the swelling of the nerve. This went on for ten days, when it became evident that the tissues were breaking down. Pus formation set in, and signs of pointing showed in the lower lid near the inner canthus. In this location, a long slender knife was thrust in along the floor of the orbit, and directed along toward the nasal side, a profuse quantity of pus being evacuated. After this the cavity was thoroughly cleansed, a drainage tube inserted, and hot alkalin stupes applied. At the end of a few days, the swelling of the tissues was almost gone. The ocular muscles regained their power, and all the ocular movements became normal. The nerve head and the general fundus also gradually recovered their normal condition, and the patient left the hospital with a correcting glass which gave him 20/20 vision in each eye.

The most plausible explanation in this case is that the infection traveled from the ethmoid cells through the nasal fossæ; but since the X-ray of the sinuses was negative, the only explanation could be metastasis or endogenous infection from grippe.

Optic Neuritis Following Influenza.

The patient was a man of sixty-seven years, who had had an attack of grippe. After about one week he noticed that his sight was becoming very dim. About two weeks after the beginning of his illness he was admitted to the Wills Hospital in a very debilitated and emaciated condition, so weak that he could hardly stand on his feet. He looked twenty years older than the age he stated.

Vision on admission: Right eye, blind; left eye, perception of light. Anterior ocular segments normal. Media 02, slight haziness of both lenses. Fundi showed optic nerve heads entirely obliterated; only by the convergence of the vessels could they be located. Swelling, about 5 to 6 D. Very hyperemic. Veins, full, dark and slightly tortuous, surrounding a retina somewhat clouded and infiltrated, but no hemorrhages. Urine negative. X-ray examination negative.

Absolute rest in bed was ordered. Eliminative and tonic treatment was given, with a nutritious diet. This was continued for about three weeks, when the patient became very homesick and, at his own request, left the hospital with his physical condition much improved and the vision in the right eye, light perception; left eye, counted fingers at four feet. During this period frequent examinations of the fundus showed decrease in the swelling of the nerve heads and the retinal edema.

Meeting held October 19, 1916. Dr. S. Lewis Ziegler, chairman.

Orbital Tumor—Possibly Osteoma.

Dr. William Campbell Posey exhibited a case of orbital tumor, possibly an osteoma, growing from the roof of the right orbit. The patient, a male, aged nineteen years, denied traumatism or other possible cause to account for the origin of the neoplasm. The growth had first manifested itself in a drooping of the lid, about eight or nine years previously, the swelling in the orbit coming on several years later. At first, double vision was present; but after several months this troublesome symptom disappeared. The patient had always enjoyed excellent health, and his family antecedents were good. Examination revealed a marked disfigurment of the face. The forehead was very prominent, this being especially marked on the right side. The right eye was much lower than its fellow, and somewhat proptosed. Palpation revealed a hard mass just below and confluent with the supraorbital rim of the right orbit. The mass was slightly bosselated, and did not pit on the firmest pressure. It merged with the inner wall of the orbit; and its external border, which presented the same characteristics as the body of the mass, terminated just within the outer margin of the brow. The upper lid partially covered the right eye and could not be raised voluntarily. Upward motion of the globe was also lost, though the other movements were unimpeded. The fundus was healthy, the optic nerve showing no alterations. Uncorrected vision equaled 5/10 in the right eye, and 5/5 in the left. There were no signs of inflammation about the eye or orbit, and the patient asserted that this had been the case since the growth was first noticed. At no time had he suffered any pain. As the patient had only presented himself on the afternoon of his exhibition before the section, there had been no opportunity for X-ray or other studies. Dr. Posey thought that, in all probability, the growth was an osteoma, and said that he purposed to extirpate it through a large incision under the brow.

An Unusual Form of Retinal Degeneration.

Dr. William Zentmayer presented the case of A. B., a girl, aged nine years, who had been sent to Wills Hospital because of poor vision, which could not be improved by glasses. Vision in each eye was 6/60.

The ophthalmoscope showed in each eye, throughout the retina, but much more markedly along the course of the temporal vessels and in the macular region, disciform, yellowish white lesions, averaging in size about one-third disc diameter. Along the vessels they were discrete; but in the macular region they were confluent. Both nerve heads showed a low grade optic atrophy. The child was well nourished and of good mentality. There was neither consanguinity nor heredity. The von Pirquet test was negative; the Wassermann positive. The visual fields showed moderate concentric contraction.

Three Cases of Ocular Injury.

Dr. Howard F. Hansell reported briefly three cases of traumatism that presented unusual features.

Case 1.—This was the case of a young man who was employed in the powder works at Hopewell, Virginia. He, in company with an older man, was approaching a large cylinder in a second-story room of one of the factories. As they came within a few feet of it there was a violent explosion, and together they were blown out through a door and over a railing, and landed on the ground. The older man died within an hour. Of seven men who had been working in the room, three were killed. The wall of the building was partly wrecked by the pieces of the exploded cylinder.

My patient believed that his eyes were blown out. He was treated for two days at the hospital at Hopewell, and was then brought to Philadelphia and admitted to the Jefferson Hospital. He had intense photophobia; he was nervous and apprehensive, and feared permanent blindness. To my astonishment, I found his eyes to be absolutely uninjured, and not a bone in his body broken. He left the hospital, and resumed his work the next day.

Case 2.—R. had been struck in the left eye with a wad of paper thrown with force by a fellow workman. He noticed, a few days later, declining vision without pain or signs of inflammation. The ophthalmoscope showed a patch of retinochoroiditis, twice the size of the disc, and fine, dense vitreous opacities. In his case, neither of the usual traumatic lesions—namely, dislocation of the lens and rupture of the choroid—was present. Under active diaphoresis vision improved to 20/30. The chorioretinal patch diminished to one-half its previous size, and the opacities in the vitreous were partly absorbed.

Case 3.—A physician, about to operate, received a splash of chloroform in each eye. For two days he was able to continue his professional work, but at the end of that time intense pain commenced and continued without interruption for thirty-six hours. Sleep was possible only after the administration of large doses of morphin. Three days later he was admitted to the Jefferson Hospital, after a painful journey of twenty-four hours. Both corneæ were superficially infiltrated, and a part of the epithelium destroyed. The conjunctivæ were intensely inflamed. The palpebral surface of each upper lid presented the appearance of subacute trachoma. The subconjunctival tissue was irregularly and unequally infiltrated with fluid and solid exudation, as though the conjunctiva were granular. Bacteriologic examination was negative. Under soothing local and general treatment, he recovered perfectly in a few days.

Eskimo Snow Blindness and Goggles.

Dr. Judson Daland (by invitation) stated that among approximately three thousand Eskimos, living on the coasts of Alaska and Siberia and in the islands of the Behring Sea and the Arctic Ocean, the common ocular diseases are conjunctivitis, cataract, trachoma and snow blindness. Notwithstanding the belief of certain authors that the Eskimo possesses a relative immunity from snow blindness, obervations show that they are as susceptible to this as is the Caucasian, and that one attack predisposes to another. Experience has taught them the necessity of protection from snow blindness, and necessity caused the invention of snow goggles made of wood. The Eskimo recognizes the fact that snow blindness occurs, not only on sunny, but also on cloudy days; and he, therefore, insists upon the importance of wearing goggles on cloudy days.

Conjunctivitis and snow blindness are usually associated with corneal erosions, choroiditis and retinitis. The ultraviolet rays cause conjunctivitis, corneal erosions, and possibly chorioretinitis. Snow blindness occurs in animals.

Discussion.—Dr. Posey said that he was under the impression that Peary had worn smoked glasses on his trip to the Pole, and that Shackleton had employed euphos lenses. The speaker had never seen a case of snow blindness, himself; but he related an experience of his own while mountaineering at a height over ten thousand feet in a thick fog, when both he and two companions were startled by perceiving numerous white and colored spots dancing before their eyes and projected on the clouds that surrounded them. He had thought, at first, that the appearance might have been due—at least, in one of his companions, who had a rather weak heart—to circulatory disturbances from the altitude and the strain of climbing; but, as he, himself, and his other friend had never suffered from any such complications, he became convinced that the visual phenomena must have been attributable to causes that he could not explain.

Mikulicz's Disease.

Dr. Posey also reported a case of Mikulicz's disease, and showed a photograph of the patient, a married colored woman, aged twenty-one years, who had first noticed a swelling of the right half of the face a year previously. The swelling in the lids had appeared three months subsequently. No other morbid phenomena had presented themselves, although the swelling in the lids had slowly increased until the time of the report. The patient averred that, with the exception of an attack of rheumatism in the left elbow, five years previously, she had always had good health. Although venereal taint was denied, the Wassermann test gave plus three. Examination showed characteristic swelling of the lids, occasioned by the much enlarged lacrimal glands. Both parotid glands were also enlarged, the right more so than the left. The right preauricular gland was palpable, and both submaxillary glands were slightly enlarged. The epitrochlear and inguinal glands of the right side were also palpable. Physical examination was otherwise negative, with the exception of decay of three molar teeth. Except for some restriction in motion upward in each eye, the eyeballs themselves were unaffected. Dr. Posey stated that the strongly positive Wassermann suggested syphilis as the causal element, and that it was his intention to begin a course of mercury at once.

Meeting held November 16, 1916. Dr. S. Lewis Ziegler, chairman.

A Case of Increasing Refraction Following Increased Tension of the Globe.

Dr. S. D. Risley presented a somewhat detailed history of a patient, now aged seventy-one years, who had for many years worn glasses, correcting hypermetropic astigmatism. Later she became the victim of a mild form of arthritis deformans, with frequently repeated acute exacerbations in one or more joints. These attacks were often associatd with painful eyes and with transient impairment of vision. The convex glasses were then rejected, and when first seen by Dr. Risley she had marked increase of tension of the right eye, with field contracted to near the fixation point, a shallow anterior chamber, and vision greatly reduced. Even with the glass she was then wearing, —2.00, vision was one-fourth plus. After a year and a half, characterized by numerous exacerbations of injection and increased tension, the hardness of both eyes almost suddenly subsided, the pain disappeared, and the anterior chambers were more nearly normal; but myopia had increased to —4. D. in the right eye, and —2.25 in the left, with vision 6/15 in the right and 6/60 in the left. This change was accompanied by an obvious thinning of the anterior ciliary region and a groove-like formation surrounding the cornea, just back of the limbus, with tension normal in both eyes. There were no demonstrable changes in the crystalline lens to account for the increased refraction.

A Case of Recurring Neuroepithelioma.

Dr. G. Oram Ring exhibited a case of extensive recurrent neuroepithelioma with the following history:

Esther N., a girl, aged eight years, was seen at the Protestant Episcopal Hospital January 7, 1916. The child had been struck in the left eye three weeks before visiting the clinic; vision was reduced to 12/200; eyeball, white; iris, responsive, but tremulous. The lens, which was completely dislocated to the nasal side, just back of the ciliary body, was partly covered with exudation and two small hemorrhages. The lower half of the retina was detached, the irregularity of the outlines suggesting the presence of a solid growth. There were likewise two irregular areas of glistening white degeneration upward and outward. Tension was normal. There were no enlarged capillary vessels. Advice given was immediate admission to the hospital for further study and operation. The diagnosis made was lenticular dislocation (traumatic), with retinal glioma.

The child disappeared from observation at once, and was not seen for nine months. During this period another dispensary service had been visited, where the growth was at first regarded as a pseudoglioma. Enucleation was said to have been advised within two months of the date of the first visit.

On August 8th the child was again struck, while at play, by a little companion, resulting in a rupture of the sclera. Enucleation was then performed at the institution above referred to; but the enucleated eye, unfortunately, was not examined.

The child was again seen at the Protestant Episcopal Hospital about the middle of October, with an extensive recurrent growth, quite two-thirds of the size of a baseball, with infiltration of the lids and temple. Examination of the sinuses was thought to be negative, but the lymphatic glands of the neck were somewhat enlarged. General examination otherwise was negative. Transillumination at the original visit to the dispensary was not satisfactory because of the irritability of the child.

At the time of exhibition there projected from the orbit for a distance of ten centimeters a very extensive fungoid mass, twenty-two centimeters in circumference, which was regarded as definitely neuroepitheliomatous in character, and inoperable.

Three days before exhibition the enucleated eye was secured; and an immediate examination by Dr. C. Y. White, director of the Episcopal Hospital Laboratory, confirmed the diagnosis.

Emphasis was placed upon the trauma and upon the added malignant disease as nullifying the usual diagnostic value of a shallow anterior chamber in malignant disease, and a deepened one in vitreous exudation, the case showing a normal chamber.

Reference was made to the exhaustive studies of Wintersteiner and Flexner as pointing to the origin of such growths in the neuroepithelium of the retina.

The three varieties of neuroepithelioma—exophytum, diffusum, and endophytum—were described; and the dictum of immediate excision with prompt microscopic study, to be followed by immediate orbital exenteration, if the infiltration posterior to the nerve indicated the further presence of malignant disease, was emphasized. It was pointed out that if early diagnosis is made and radical operation done, about sixteen per cent of such cases can be saved. The necessity for differential diagnosis in ten different ocular conditions was dwelt upon.

Cranial Deformity With Optic Atrophy—Opticociliary Vein in the Left Eye.

Dr. T. B. Holloway exhibited a young man with the following history:

J. L., aged nineteen years, a Hebrew, was first seen in September, 1916, when he came to the Polyclinic Hospital, desiring an operation for a divergent squint. He had had poor vision as long as he could remember. He had been subject to convulsions since the age of one year; but during the past year the attacks had been less severe, and he did not fall, but merely became "dizzy" for about three minutes. His mother was dead, the result of pneumonia complicating labor. His father, three brothers, and three sisters were living and well. No brothers or sisters were dead. He denied venereal disease, and said that, aside from the convulsions, he had never been ill. He was five feet one inch in height, and weighed one hundred and twenty-five pounds.

Neurologic and medical examinations failed to reveal any organic trouble. Nose and throat examination disclosed a deviation of the nasal septum to the left side. There were no abnormalities, aside from extra canine teeth. The head was not of true tower skull type, the deformity not towering anteriorly. The Wassermann test was weakly positive. Skull measurements: Bitemporal, 117 millimeters; stephanion diameter, 130 millimeters; maximum transverse, 137 millimeters; anteroposterior, 186 millimeters; circumference, 524 millimeters; biauricular curvature, 332 millimeters; cephalic index, 73.6.

Both eyes were prominent. The right eye measured 22.5; the left, 22 millimeters, with Hertel's exophthalmometer. There was a divergent squint of the right eye, measuring ten degrees on the perimeter. There were no extraocular palsies. Upon attempts to fix a near object, the right eye remained divergent; but both pupils reacted with a well marked contraction. Both reacted well to direct and indirect light. Each disc showed a well advanced atrophy, with but slight reduction in the caliber of the retinal vessels. On the left disc a small vessel entered the inferior temporal vein between the exit from the papilla and the disc margin. It described an S-shaped course, and disappeared, at the nasal margin of the disc, into the choroid, where it could be followed for a millimeter or two. In color it corresponded with an artery; in appearance it corresponded to the description given by Shoemaker (ANNALS OF OPHTHALMOLOGY, 1909, Vol. 18, p. 241). Each eye was of the compound myopic, astigmatic type. Vision right eye, fingers at fifteen inches; left eye, 6/15.

Dr. Holloway referred to the various theories concerning the etiology of the cranial deformity, as well as the optic atrophy. In exhibiting the stereoscopic X-ray plates made by Dr. H. K. Pancoast, he commented upon the enlargement and displacement of the sella turcica and the massive bony development of the face, and thought it possible that disturbance in the function of the pituitary body might be responsible for the latter. With the right eye there was loss of the macular field and of the upper half of the field, except a small isolated patch. He thought that this might be due to some constriction or pressure about the optic foramen, such as might occur in an exaggeration of the condition found and described by Behr.

Discussion.—Dr. Zentmayer asked whether Dr. Holloway had found in literature any reference to glandular feeding in these cases. The results secured from such therapy might have some bearing on the relation of pituitary disease to this condition.

Hyalin Bodies on Optic Nerve Head.

Dr. Edward A. Shumway reported a case showing an unusual development of hyalin bodies on the optic nerve head. The patient was a man, aged twenty-one years, whose vision had been very poor since early childhood. The margins of each optic nerve were covered by extensive clusters of the hyalin bodies, which were peculiarly wax-like and glistening in appearance. The macular region in each eye was the seat of widespread superficial disturbance of the choroid and retina, so that vision was reduced to 6/30. The retinal vessels were reduced in caliber, and the visual fields were contracted, especially for color. There was achromatopsia for green. Dr. Shumway thought the macular lesion might be considered a pigmentary degeneration of the retina without pigmentation. The two conditions had been reported together in a number of instances. He referred to the blurring of the nerve heads, usually present, and said that he believed all cases of "pseudoneuritis" should be watched from time to time; as he had known of two cases that for a long time were considered "pseudoneuritis," in which the condition had developed into choked disc, and upon operation brain tumor had been found.

Discussion.—Dr. Holloway stated that he had seen but one other case in which the lesions were as marked as in the case described by Dr. Shumway. He had observed the presence of hyalin bodies in cases of retinitis pigmentosa, and referred to one patient who had been under observation for at least six years, during which the lesions had increased in number, being now quite extensive, but not so marked as in Dr. Shumway's patient.

Dr. Zentmayer said that the presence of hyalin bodies on the papilla in pigmentary degeneration of the retina cannot be of so rare occurrence. He had seen three such instances in his own limited experience with the affection. Some years ago he presented at the section a patient with marked hyalin deposits on the papilla, associated with hyalin changes in the retina, and said that the case suggested that in some instances, at least, there might be a relation between the two conditions.

The Ophthalmoscopic Aspects of the European War as Seen in the American Ambulance of Paris.

Dr. Hunter W. Scarlett stated that the peculiar nature of trench fighting produced so many head and face wounds that the number of eye cases was necessarily large. During the first two years of the war the Eye Service of the American Ambulance treated about five hundred cases. These were of all degrees of severity, and consisted of traumatic conjunctivitis; foreign bodies (intra- and extraocular); traumatic cataracts; tears of choroid and retina, and detached retinas; injuries to optic and oculomotor nerves; wounds of the orbit, causing loss of lids and conjunctival sacs, and in some cases of the bony parts of the orbit; cerebral injuries, producing lesions of the optic centers and pathways.

Most enucleations were done under local injections of novocain and adrenalin. This was due mainly to the fact that the administration of ether would have exposed the patients to pneumonia, because of the accompanying face injuries, which were usually present. The percentage of blind in the American Ambulance was three per cent.

The projectiles causing the ocular wounds were as follows, in their order of frequency: (1) Exploding shells; (2) rifle and machine gun balls; (3) grenades; (4) bombs; (5) shrapnel. Their mode of action was:

1. Contusion of the globe by either direct or indirect action.
2. Rupture of the membranes, with or without penetration.
3. Infection of the globe after injury.
4. Section or injury to the optic or oculomotor nerves.
5. Intracranial lesions.

Meeting held December 21, 1916. Dr. S. Lewis Ziegler, chairman.

Bilateral Choked Disc Following Thyroidectomy.

Dr. Frederick Krauss presented the history of a patient, male, aged twenty-three years, who had intense perspiration, delirium, tetany and dizziness after an operation for thyroidectomy. Two months later he was still intensely nervous, depressed, with almost constant attacks of blindness, though his central vision was practically normal. He had an abnormally large red field crossing the form field. He had bilateral choked disc, the left eye showing a very small hemorrhage in addition. The swelling extended particularly along the course of the blood vessels, subsiding in about six weeks. Six months later there was no sign of the trouble, except very full lymphatics on a very gray disc. Vision and nervous system had apparently returned to normal lines.

Dr. Krauss felt that the traumatism in the removal of this cystic goiter had injured the sympathetic nerves in this region, causing a severe vasomotor reaction which produced an edema of the brain and optic nerves, with extension of the retina. These disappeared, leaving no permanent results.

Aviator's Dazzling.

Dr. T. B. Holloway, referring to the subject of aviator's dazzling, alluded to the recent large appropriations made by Congress for the use of the Aviation Service and the establishment of schools for aviation. He referred to a lieutenant in the navy who had come under his observation during the summer of 1915. While on duty at an aviation station his eyes became somewhat painful, slightly injected, and there was some burning sensation of the lids. This was accompanied by poor ocular endurance for near work. A competent oculist, who saw him about this time, reported that he had some ciliary spasm, retinal hyperemia and marked irritation of the conjunctivæ of the eyeballs and lids. After the correction of a compound hyperopic astigmatism, he was advised to discontinue his aviation work. From that time on his eyes showed some improvement, but there was no complete relief. Later on he was assigned to destroyer duty, and after a trial trip many of the old symptoms returned. At this time he came under Dr. Holloway's observation, and the only change appreciable was a hyperemia of the conjunctivæ. There were no fundus changes, and with a suitable correction, 6/6 vision was obtained with each eye. He was forbidden work that would subject him to glare. He resumed his duties at the aviation station in the fall, and with the use of a tinted lens he reported that he was quite comfortable.

Dr. Holloway alluded to some of the literature relating to the effects of glare, and called attention to the recent articles of Zade, who has described numerous cases observed in the German army, not only in the aviation corps but especially among the anti-air craft gun crews. This observer also reports the frequent occurrence of a peripheral scotoma.

In closing, Dr. Holloway stated that he was very sorry he had not made a perimetric examination of the case, but at the time the patient came under observation Zade's work had not been reviewed.

Dr. Holloway stated that he thought he had suggested amber tinted glasses, although he had failed to note this on his records. He thought that while Zade had recommended a euphos tint, probably one of a dozen different tints might answer the same purpose.

Lupus of the Lids and Cornea.

Dr. L. W. Hughes (by invitation) presented a patient, male, aged twenty-two years, who at first complained of poor vision in the left eye and swelling of the lids. The family history was negative except that his mother, one brother, one sister and an aunt died of tuberculosis. His father and one brother were living and well.

The patient had always been well except for an occasional headache. Denied ever having had any venereal infection. He used tobacco and alcohol moderately.

In August, 1914, the patient first noticed what he called a "small pimple" on the lower lid of the left eye, near the outer canthus. This rubbed his eye each time he closed his lids. He received treatment from his family physician, and the pimple disappeared. About three or four weeks ago, while at work, some powdered slack lime got into his eyes. Both eyes became red, swollen and sore, and upon looking at the eye he first noticed a little red mass beneath the upper lid, about twice the size of a pinhead. It became larger, but did not cause him any inconvenience.

The eye began to discharge about the latter part of September of the same year. He was then sent to the Philadelphia General Hospital, and the condition was diagnosed as a tuberculoma of the eyelid. This growth was removed by Dr. Hansell on October 4, 1914, and the laboratory report by Dr. R. C. Rosenberger proved the former diagnosis to be correct.

At the time of the report the examination of the left eye showed the upper lid to be swollen, and the margin of the lid appeared to be roughened. Upon eversion of the lid there were a number of soft dark red papules that gave the typical "apple jelly" nodular appearance first described by Mr. Jonathan Hutchinson. At the center of the lid was a furrow or sulcus, as an evidence of where the old tuberculoma was removed. There was swelling and hyperemia of the conjunctiva and some drooping of the eyelid. A corneal ulcer was seen at the left lower quadrant, with considerable bulging of the cornea. Vision, 6/30.

There were a number of enlarged glands of the neck which had broken down, and a discharging sinus on the left side of the face, near the ear.

Dr. Hughes summarized the case as follows:

1. Family history of tuberculosis.
2. Involvement of the lids and cornea was independent of the involvement of the nose and cervical glands.
3. Removal of the tuberculoma and its positive diagnosis by laboratory reports.
4. Slow growth.
5. Repeated negative Wassermanns ruled out syphilis.
6. Improvement of general condition by good food, rest, fresh air and light exercise.

Discussion.—Dr. C. E. G. Shannon stated that at the time of the patient's admission to the hospital the upper lid was swollen, and on its eversion a growth about the size of a small walnut was seen. It was polypoid in form and granular in appearance, and was attached to the tarsal conjunctiva by a short thick pedicle. The surrounding conjunctiva was occupied by a great number of papillary growths, while the surface of the lid was bathed with a mucopurulent secretion. The present appearance of the conjunctival lesion shows a marked excavation at the site of the former growth, surrounded by a preponderance of papillary proliferations.

Dr. Shannon said that involvement of the cornea, as shown in this case, is rather frequent in lupus of the conjunctiva, and therefore we should always regard the prognosis as grave, as extension of the process may cause destruction of the cornea or even the eyeball itself.

Dr. Burton Chance, in commenting upon Dr. Hughes' case of lupus of the eyelid, gave an outline, in both the dermatologic and the ocular aspects, of this manifestation of tuberculosis, a disease which occurs so rarely in the practice of ophthalmologists. He stated that he had not had a patient exhibiting active symptoms, but he had had several who had applied for relief from the effects of the disease of the lids, the ducts, and of the globes. In these there were quite severe erosions of the skin, notably of the alæ of the nose, in which region it is so stated by dermatologists that it frequently first shows itself, and is well shown in the case before us. Chance's cases had been in blondes and mostly Irish born; he does not recall a case in a negro.

Lupus is so rare that few ophthalmologists and dermatologists, too, have seen it in America, yet it is comparatively common in European clinics.

The disease is a chronic cellular infiltration of the skin, producing nodules beneath the surface, which increase in size and form patches. These patches may become absorbed or may ulcerate, to be followed by cicatrization. The origin of the disease depends upon the invasion of the tubercle bacillus. It is manifested by a combination of proliferation and ulceration, granulation and cicatrization, affecting chiefly the corium. The nodules consist of cells grouped around the capillaries and contain giant cells, yet the tubercle bacilli, although pathognomonic, are few in number, and are not always present in all specimens, although they were found in the nodules excised from the lid in the present case. The reactions to tuberculin tests; notwithstanding, are completely positive. The mode of invasion is uncertain: it may be by direct inoculation; by extension from deeper foci; through the circulation; and even by maternal transference.

The patients usually present the scrofulous cachexia, with more or less adenitis, but, except for the ulceration, they are remarkably free from subjective symptoms.

The mucous membranes may be invaded, and, when the disease has lasted a long time, the eyeballs and the globe may become involved. The lids may become distorted, the conjunctiva contracted, and the cornea destroyed in the serious cases. The disease lasts many years; is rebellious to treatment; but in America the course and symptoms are less protracted and severe than in Europe.

The treatment consists in the pursuance of such general regimen as should be applied in cases of a more general tuberculosis, and by immunization by tuberculin inoculations. Locally, may be used pastes; radiant emanations; Finsen light; high frequency currents in the manner of desiccation, as being amongst the most efficient methods. When it invades the eye the ulceration should be excised or curetted and the raw surfaces cauterized. Not much hope can be held out when it invades the globe, especially the cornea.

Dr. Chance said that he had been so much impressed by the beneficial results obtained from the Maxwell operation in certain cases under Dr. Zentmayer's care, that he himself had performed it two or three years ago in a case, of which he had endeavored to have the patient present tonight. In that case the lower lid had been drawn far into the orbit and the upper lid was a mere nodule. By the Maxwell operation the patient had been pleased to wear a modified glass eye, and three weeks ago submitted to operation to restore the position of the upper lid by means of the method described by Dr. Schwenk before this section in December, 1915. The immediate effects of the last operation brought about the formation of a distinct cul-de-sac, which, however, has contracted somewhat in the past few days. Because of the benefit derived from

Maxwell's procedure on the upper lid in Dr. Zentmayer's patient, Chance is considering to attempt it in his case, should the contraction become greater. The Maxwell operation not only increases the capacity of the orbital socket, but also succeeds admirably in the restoration of the contour and function of the eyelids.

Implantation Cyst of the Anterior Chamber.

Dr. Harold G. Goldberg presented a case of implantation cyst of the anterior chamber following a punctured wound of the eyeball received several months before the appearance of the growth. The cyst was of the pearl tumor type, composed of both epithelium and connective tissue, which had been conveyed to the anterior chamber through the original wound. Two attempts were made to remove it by operation, each time including a section of the iris. The vision of the eye was very little affected, and there was no evidence of any extension into the deeper structures. Dr. Goldberg believed, however, that the iris had become so deeply invaded by the epithelial growth that a thorough removal was impossible.

Double Maxwell Operation.

Dr. William Zentmayer exhibited a case of contracted socket in which a double Maxwell operation had been performed five years previously. The pedicle grafts in the cul-de-sacs had not shrunken in the least, and the patient was wearing an artificial eye with comfort. The levator, which had to be cut in order to slip the skin graft through the incision made through the thickness of the lid, had its function unimpaired.

Hydrophthalmos.

Dr. Zentmayer showed an extreme case of hydrophthalmos. The right eye was blind and soft. The left eye had vision of hand movements; tension stony hard. Dr. Zentmayer discussed the hypotension of the right eye in the light of Treacher Collins' studies regarding the phenomenon in contusions of the globe, and concluded that it was probably the result of the rupture of the sclera from striking the eye, as the child's forehead bore many scars received in this way.

J. MILTON GRISCOM,
Clerk.

NEWS AND ITEMS.

BY

BURTON CHANCE, M. D.,

PHILADELPHIA.

American Board For Ophthalmic Examinations.

The American Board for Ophthalmic Examinations which is identical in personnel with the Ophthalmic Credentials Committee of the American College of Surgeons, will give the next examination to accepted applicants immediately following the meeting of the American Medical Association, beginning the evening of June 7th, and extending over June 8th and 9th.

Those who desire to be certificated by the Board should make application to the Secretary, Dr. Frank C. Todd, 506 Donaldson Building, Minneapolis, Minnesota. Applicants for admittance to the American College of Surgeons who have been accepted for examination by the College, should notify the officials of the College of their desire to take this examination.

The American College of Surgeons has appointed the members of the American Board for Ophthalmic Examinations as their Ophthalmic Credentials Committee. This examination will thus serve for a double purpose.

BOOK REVIEWS.

Diseases of the Eye.

By GEORGE E. DE SCHWEINITZ, M. D., LL. D., Professor of Ophthalmology in the University of Pennsylvania, etc., etc. Eighth edition. Published by W. B. Saunders Co., Philadelphia and London, 1916.

This edition is a complete revision and amplification of former ones, being brought up to date by the addition of many new subjects. Lieut.-Col. Elliot has written the description of his method of operating for glaucoma, and Dr. William M. Sweet has described his revised method of localizing foreign bodies by means of X-ray. The high standard of previous editions is maintained in this one, and it is hardly necessary to say that it should be in the hands of everyone who requires a textbook on ophthalmology. C. L.

Diagnosis From Ocular Symptoms.

By MATTHIAS LANCKTON FOSTER, M. D., F. A. C. S., etc. Published by Rebman & Co., New York, 1917.

In spite of the modesty with which Dr. Foster presents this work, it should be welcomed as a distinct advance in ophthalmic literature. The author has not always followed out his plan of "utilizing the symptom or condition that predominates in the mind of the examiner as the central figure from which to work outward towards the diagnosis," etc., but in a book of nearly 500 pages he has certainly indicated a more rational method of studying diseases of the eye than that which obtains in the ordinary textbook. It is to be hoped that other authors will follow this plan. For the beginner, this work should prove especially valuable. C. L.

Cataract—Senile, Traumatic and Congenital.

By W. A. FISHER, M. D., Professor of Ophthalmology, Chicago Eye, Ear, Nose and Throat College. Published by the Chicago Eye, Ear, Nose and Throat College, 1917. Price, $1.50.

This book of 119 pages is largely devoted to an advocacy of extraction of cataract without capsulotomy, the socalled Smith Indian operation, with modifications and suggestions by the author. Dr. Fisher is one of the foremost advocates of this method, and his book is entitled to a high degree of consideration. After reviewing the technics of extraction in the capsule found in the writings and textbooks of various authors, Dr. Fisher describes his method, and advocates the use of the eyes of kittens for those who wish to perfect themselves in his technic, or any other. A few papers are republished, and the book closes with a brief discussion of traumatic cataract in the adult and congenital cataract. The book is one which will be valuable to every oculist, whether proponent or opponent of the method. C. L.

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XXIV.

THE COMFORT TEST AS A METHOD OF REFRACTION.

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BUTTE, MONTANA.

A large majority of patients who call upon oculists and opticians do so for relief from the discomforts of eye strain. Since comfort is their desire, I have come to call the method by which I do my refracting the Comfort Test. It makes no difference to the patient, so long as he is comfortable, whether or not the method of examination or the results obtained are absolutely scientific. The patient does not care if these methods are not in exact accord with the opinions of our best oculists, because the ordinary patient is unable to distinguish between scientific and unscientific methods, but can tell very quickly if the results are satisfactory.

Since the optician is able to get satisfactory results in such a large percentage of his tests, there must be some value in his method of examination. Many patients prefer to have the eyes tested without the use of "drops," and they often run the risk of poor results at the hands of an incompetent optician, rather than undergo the inconvenience and loss of time resulting from the use of a mydriatic in the hands of a skilled oculist. Thus, unskilled and unprincipled opticians care for many cases which would otherwise be properly cared for by competent oculists or opticians.

During the last five or six years I have been using a method by which the use of a mydriatic is eliminated in the majority of cases, and the results have been so uniformly satisfactory, that I am venturing to describe it in order that others may use it and avoid the inconvenience of which patients complain so often. There is practically nothing new about the method except a set of compound lenses. There are, however, a few points in technic which are not ordinarily given in descriptions of the fogging method, but which are so essential to good results that it seems advisable to give them in considerable detail. In order to make these points plain, it will be necessary to describe a complete test.

After the patient's history has been taken, he is placed before the test cabinet and the phorometer is adjusted so that he looks exactly through the centers of the lens holders, with the head in as natural and as comfortable a position as is possible; the left eye is covered and the best possible naked eye vision of the right eye obtained; he is encouraged to read the smallest letters possible, and the mistakes and amount of apparent effort are noted; a toric + 7.0 sphere is placed in the back cell of the phorometer as close to the eye as is possible without the lashes touching the lens[1]; the patient is advised to keep the eye as quiet as possible and to make no effort whatever in trying to overcome the blurred vision. When the eye has had time to accustom itself to the blurred vision, a — 0.50 sphere is placed in the front cell of the phorometer. After a few seconds the — 0.50 sphere is removed and a — 1.0 put in in its stead. This process is repeated, increasing the strength of the minus lens by 0.50, until the patient is able to read 20/40. Sufficient time is taken between the changes to allow the muscle of accommodation to relax and to become entirely adjusted to the combination of lenses in front of the eye. If the patient seems to be nervous or for any reason unable to relax the accommodation, an extra amount of time is allowed between changes, and the patient's attention detracted from the test by engaging him in conversation. When he is able to read 20/40 or a little better, never more than 20/30, the minus lens is removed and a plus lens is put in its place, the strength of which is 0.25 or 0.50 more than the difference between the minus lens in the front cell and the + 7.0 in the back cell; that is, if there is a — 6.0 in the front cell, the difference would be + 1.0. If the patient is able to read 20/40 with this combination, a + 1.25 is placed in the front cell; if he is able to read 20/30, a + 1.50 is used; the + 7.0 is removed, and if the patient reads as well or better with the single sphere than he did with the combination, a sphere 0.25 or 0.50 stronger than the one in the front cell is then placed in the back cell and the front one removed. The same process is then gone through with the left eye.

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[1] A toric sphere is used for two purposes: first, in order to get the lens close to the eye; and, second, to reduce the space between this lens and the lens to be placed in the front cell of the phorometer.

The reason for substituting a sphere stronger than the combination of the + 7.0 and the minus lens is that with the two lenses we have four strongly curved surfaces and an interspace. This combination interferes with vision more than the two weakly curved surfaces of the equivalent single lens, the result being that the patient will be able to read one or more lines on the chart with the equivalent lens than with the combination. This increased strength of lens is used on account of the fact that it is not advisable to have the patient read below 20/30 at this stage of the test, because the test for astigmatism is best done with the vision fogged to the point that only one or two sets of lines are distinct rather than that all should be fairly distinct and only one or two showing some blur.

The important part of the test is to determine the exact amount of astigmatism present, and for this purpose the following method of testing is an improvement over that ordinarily described by men using the fogging method. With the patient unable to read more than 20/30, the astigmatic chart is placed before him and he is asked to decide which set of lines is most distinct. If he decides quickly it is evident that there is considerable astigmatism present, and one may begin with a fairly strong cylinder; if he hesitates and is unable to decide definitely which is the more distinct, it is probable that the astigmatism is not very marked and that only a weak cylinder is required. A minus cylinder is placed in front of the sphere, with its axis opposite to the direction of the most distinct lines; if this lens does not make the lines equally distinct in all directions, then minus cylinders of increased strength are used until the lines of the chart are equally distinct in all directions. However, if the minus cylinder required is sufficient to reduce the strength of the combination enough to bring the vision down to 20/25 or better, a stronger sphere is substituted for the one in the back cell of the phorometer, and the process of determining the proper cylinder is then continued, always keeping the vision fogged to 20/25 or poorer.[2] After the minus cylinder which seems to equalize the lines has been selected, a — 0.25 cylinder is held in front of the combination; first, in the same plane as the other cylinder, then, at right angles to it. If this does not accentuate the corresponding set of lines when held in either direction, the original cylinder is not correct and the test must be continued until this final test can be applied. This last test may be verified with a + 0.25 cylinder. With the strength of the cylinder satisfactory, the correct axis is determined by rotating the cylinder until there is a difference in the distinctness of the lines. After noting the position of the axis when the patient is first conscious of the change, the cylinder is then rotated in the other direction until the lines are again unlike. The mean of these positions is usually the correct axis. This may be verified by having the patient rotate the cylinder and place it in the best position. Usually the position found by one method practically coincides with that found by the other. Experience indicates that corrections need not be made closer than quarters, either with spheres or cylinders, or by less than five degree intervals, hence a large amount of detail work is avoided without any appreciable loss to the patient.[3]

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[2] This change of sphere is to be made in such a way that at no time is the eye left without a plus lens at least as strong, if not stronger, than the one found by the test up to that time. To accomplish this a plus sphere stronger than the one in the back cell of the phorometer is put in front of the minus cylinder. With this second sphere in place the one in the back cell is removed and the desired sphere put in in its stead. The sphere in front of the cylinder is now removed and the test for astigmatism continued.

[3] On this account I have taken out of my trial set the 0.12, 0.37, 0.62 and 0.87 spheres and cylinders and substituted for them 0.25, 0.50, 0.75 and 1.0, so that my set as used in these tests contains two pairs each of these lenses.

It occasionally happens that the patient will select as the most distinct set of lines those opposite to the ones which really should be most distinct. This occurs when the eye is not sufficiently fogged or possibly too much fogged. The error can be recognized before the test is completed and the proper correction substituted. If we assume that the conoid of Sturm is the correct figure to illustrate the relationship of the rays of light as focused by an astigmatic eye, there will be little difficulty in understanding this apparent change of axis.[4] Experience seems to indicate that if the vision is kept fogged between 20/25 and 20/40, the focal interval is kept in front of the retina, yet not far enough in front of it to cause too much blurring of all parts of the chart. This is the reason for using a sufficiently strong sphere in the back cell of the phorometer to keep the vision fogged to 20/25 while the minus cylinders are being used.

This amount of fogging, by keeping both focal lines in front of the retina, puts the eye into a state of artificial compound myopic astigmatism, and no amount of accommodation can improve the vision. In this condition the lines on the astigmatic chart corresponding to the posterior focal line will be the more distinct ones, and will remain so as long as the posterior focal line is the one nearer the retina. If now the anterior focal line is thrown backward toward the retina by means of minus cylinders placed in front of the sphere, the focal interval can be obliterated, the astigmatism neutralized, and the eye thus made artificially myopic. If, however, too strong minus cylinders are used, the anterior focal line will be thrown behind the posterior one and the eye again become astigmatic, but in the opposite direction. Because the original anterior focal line is now the one closer to the retina, an opposite set of lines will be the more distinct.

An increase in the strength of the minus cylinder will increase the difference in distinctness of lines on the chart until this focal line has reached the retina, when a further increase of the minus cylinder seems to equalize the lines again. At this stage careful observation will bring out the fact that the chart is becoming blurred, that certain letters are not read as correctly as before, and that the patient is making evident effort at accommodation. The eye is now in a condition of artificial mixed astigmatism, and the accommodation can, and does, materially affect the results obtained by the test.

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[4] See Fuchs' figure 384 (third English edition) or similar figures in other textbooks for graphic illustrations of this geometric figure.

If the eye is so fogged that the posterior focal line is behind the retina, but nearer the retina than the anterior focal line, a certain set of lines will be the more distinct, but as the minus cylinders are added the anterior focal line comes to be the one nearer the retina, so that an opposite set of lines become the distinct ones, and this without having fully corrected the astigmatism. The natural tendency under such circumstances would be to reduce the strength of the minus cylinder, while in fact it should be increased in order to bring the two focal lines together, neutralize the astigmatism, and thus convert the eye into an artificial condition of simple hyperopia. This error is to be suspected when the same combination of lenses gives varying results, and especially if the patient seems to be making undue effort to see. The suspicion is confirmed if by increasing the strength of the sphere in the back cell of the phorometer the patient is able to read as well as with the weaker lens, without the evident effort of accommodation, and the lines of the chart can be equalized more satisfactorily by a stronger minus cylinder.

Sometimes this error is not recognized until the near test is applied, when it is found that the patient will accept considerable increase of sphere, showing that he has been using too much accommodation for distance. All such tests must be repeated under proper conditions of fogging, in order to be certain of the correction for astigmatism.

If the eye is so strongly fogged that all lines on the astigmatic chart are badly blurred, the patient may not be able to discern that one set of lines is more distinct than the others, but in his desire to assist in the examination he may accommodate strongly and at the same time, as a part of the same muscular effort, contract the pupil and pull the eyelids together. This results in a reduced and more distinct image on the retina, and may change the curvature of the cornea enough to bring a set of the blurred lines into a little better focus. This change in shape of the eyeball may convert the eye into an astigmatic condition opposite to its natural astigmatic state. Minus cylinders used as above directed will exaggerate rather than correct this astigmatism, hence an apparent change of axis will take place before the test is completed.

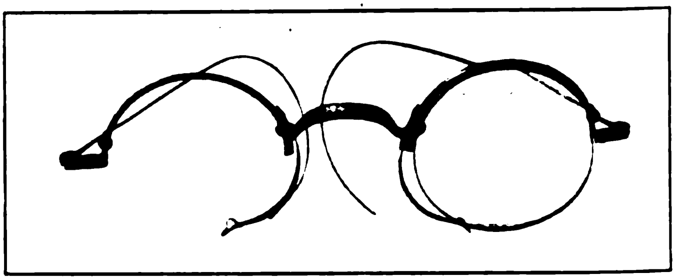
The same method is used with the other eye, using as much care in the fogging and in determining the cylinder, because it is not uncommon to find that the two eyes differ so materially that no opinion of what should be found for the second eye can be formed from what has been found for the first eye.

The last part of the test is to determine the strength of sphere necessary. The astigmatic correction is always determined, as stated above, with the eye so fogged that the vision is not better than 20/25 at any stage of the test. After determining the strength of cylinder under these conditions, the sphere is gradually cut down until the vision is a little less than 20/20, or such that 20/20 is obtained with a — 0.25 sphere in front of the other combination. That is, the strength of lens to be left in front of the eye should be at least 0.25 stronger than that which gives 20/20 with the single eye. After both eyes have been brought separately to this stage, it is usually found that the two eyes together have 20/20 vision with the lenses 0.25 stronger than that which gave 20/20 vision with each eye alone.

The near vision of each eye is then tested. It is often found that it is more comfortable to read with a lens 0.25 to 0.50 stronger than that which has been found for distance. That is, each eye will accept from 0.50 to 0.75 more lens strength for near vision than that which gives that eye singly perfectly distant vision. In the majority of cases the lens which gives the best near vision will be comfortable and give fairly good distant vision after being worn a short time. After the regular reading test has been applied the eyes are tested for muscular imbalance.

This completes the first half of the test, but if the lenses were prescribed on a single test, however carefully the test had been carried out, a large percentage of the glasses so prescribed would not be satisfactory. In order to guard against this I am in the habit of applying the Comfort Test by means of a set of round compound lenses and a set of light trial frames. As already indicated, this is the only part of the paper which has any claim to originality, and on that account a brief description of the lenses and frames will be given.

The lenses are compounds, and being round, the axis of the cylinder can be placed at any desired angle, thus making each lens serve theoretically for 180 prescription, practically for at least 36. The strength of the lens and the axis of the cylinder are etched on the lens in such a position as to be easily read, and yet not in any way interfering with the use of the lens. The strength is indicated by numbers, the sphere first, the cylinder second, as + 0.50, + 0.75, — 1.0, — 0.50, — 0.25, + 1.25, etc. The position of the axis of the cylinder is indicated by a short etched line at each end of the axis. Experience indicates that less than two hundred pairs will duplicate practically every prescription to be written in the ordi-



nary routine of office practice. Even a much smaller number, if carefully selected and confined to single lenses in the less frequently used combinations, will suffice, but the satisfaction of being able to duplicate any desired prescription will warrant a complete set.

The frames,[5] about thirty in number, are so chosen as to duplicate practically any frame measurements so far as pupillary distance and bridge dimensions are concerned. These frames are a modification or rather a contraction of No. 2278 American Optical Company trial frame. The celluloid scale, the lower half of each eye wire, and the back lens holder have been removed. This leaves only the bridge, the upper half of each eye wire, the front lens holder and the temples, so that a very light, comfortable frame is the result. When such a frame and pair of lenses are on the face, the patient is little or no more annoyed with the set than if it were his finished prescription. Since the lenses are made from ordinary lens stock, they should be just as comfortable and serviceable, when put into a properly selected frame and used in the office for close work by artificial light, as when made to prescription and used at home for the same kind of work. Care must be exercised in selecting the frame, because much discomfort may come from improperly mounted correct lenses.

My practice is to make at least two complete tests, preferably on different days, and have the patient use the lenses in the office for close work by artificial light as long as he or she will want to use them at home. Women are usually requested to bring some of their most trying fancy work for the second Comfort Test. If the eyes remain comfortable during such a test, the lenses may be prescribed without fear of being unsatisfactory. It is not uncommon to have a headache which was more or less severe at the beginning of the test disappear entirely during the Comfort Test. In fact, it is a common practice to ask the patient who has eye headache to come for the final Comfort Test when having a headache, and if the ache is relieved while wearing the lenses, the test is considered satisfactory.

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[5] The frames will accept the lenses of the ordinary trial case, so that these may be used where simple spheres or cylinders are needed.

If the eyes are not comfortable during the Comfort Test, the lenses are to be changed as soon as they begin to tire or the head to ache. Either the sphere or the cylinder may be increased or decreased, or both sphere and cylinder may be changed, before one or both eyes. The position of the axis of the cylinder may be changed also, especially if the sides of the book seem to be unequal. If such changes as these do not give relief, the preliminary test is to be repeated.

If repeated tests do not result in a satisfactory lens, a different method of testing is to be resorted to, or the case discharged, because experience has proven beyond a doubt that a lens which is not comfortable in the office test will not be comfortable at home, and its prescription is not justifiable. These are the cases to be tested under a mydriatic. However, I am frank to say that I have long since discontinued testing such cases by that method, because I rarely get any more satisfactory results in that way than by the Comfort Test. These are usually the cases in which the eye symptoms are only local manifestations of some systemic disease, and general examination and treatment are necessary to relieve the condition. Such cases are referred to a diagnostician, with the usual result that sufficient is found to account for all symptoms, and glasses are not prescribed, or if prescribed are for temporary use only.

The reason why cases tested by the Comfort Test are as satisfactory as those tested under a mydriatic is obvious. With the Comfort Test the eye is in its natural condition and under as nearly usual surroundings as is possible. The pupil is of its normal size and admits the same amount of light it will admit when the lenses are being used at home. The muscle of accommodation receives and responds to stimuli as it will after the glasses are prescribed. These two items are of considerable importance, because it is impossible to determine the exact amount of refractive change which takes place when an eye is paralyzed with a mydriatic. When the total amount of refractive error has been determined under a mydriatic, there still remains the uncertain factor of effort which the muscle of accommodation will make after it has recovered from the effect of the drug. This factor varies with each individual and with the circumstances under which the eyes are to be used. This factor must be guessed at if the lenses are to be fitted at once, so that the prescription will not be any more nearly accurate than if fitted by the ordinary fogging method. Lenses so fitted often must be changed one or more times before the patient can wear them with comfort. In other words, the Comfort Test is applied at home at the expense of much time and annoyance on the part of both patient and oculist. After a few such changes the patient realizes that the oculist is guessing at the prescription, and so loses confidence in the doctor's ability and integrity. If the lenses are not fitted immediately after the test under the mydriatic, but are determined by a postcycloplegic test, the main part of the cycloplegic test is lost, and the method again approximates the Comfort Test, because the final lens is the one which the eye will accept, regardless of what has been found under the mydriatic. Again, there is much inconvenience and loss of time on the part of the patient, with no better results on the part of the oculist.

The amount of time required for the Comfort Test is no more on the part of the oculist and much less on the part of the patient than when the test is made under a mydriatic. The reason why so little time is required on the part of the oculist in doing the Comfort Test is that all of the fogging can be done by an office assistant, so that the oculist must do, personally, only the testing for astigmatism, the final part of the distance test and the near vision test. The office assistant can change the lenses as directed in the Comfort Test without taking more than a few moments of the oculist's time.

It has been claimed by some that when fogging is done by using a sphere as strong as + 7.0, especially if considerable time is given to the test, the muscle of accommodation may and often does become overrelaxed, with the result that the lenses found will be too strong and cannot be worn with comfort. While such a result is possible, experience leads me to believe that it is improbable if proper care is exercised, and especially if the Comfort Test is relied upon. In a very small number of cases it is necessary to reduce the strength of the lenses, as found by the fogging test, before the eyes can be made comfortable during the Comfort Test. The majority of cases are the opposite—that is, the lenses must be increased during the Comfort Test, on account of a weakened accommodation, and the amount of increase is often dependent upon the length of time taken for the Comfort Test, because the longer the eyes are used the more tired they become and the more plus sphere they will accept. A weakened accommodation found by such a test may be the first and only symptom of some obscure and unsuspected systemic disease, and if taken as a warning may be the means of causing the patient to get proper medical advice in the early stage of a condition which, if neglected, might become serious.

Cases of weakened accommodation are not to be fitted with the full strength of lens necessary for long continued use, but rather the weakest lens possible for the smallest amount of close work it is absolutely necessary to do, and with the injunction that the eyes are not to be used beyond the point of beginning discomfort, without a few moments of rest. Such eyes will often do several hours of close work each day, without much fatigue, if allowed frequent short periods of rest.

Some cases of apparent weakened accommodation are not connected with bodily weaknesses or disease, but are beginning presbyopia, even though the patient is not forty-five years of age. Such patients have usually been wearing distance lenses which are weaker than the full correction for distance, so that the muscle of accommodation is under a constant strain and thereby weakened from the overwork of both distance and near. Such cases are often materially relieved by putting on lenses which are 0.50 to 0.75 stronger than that which gives perfectly distinct distant vision. This gives much relief and avoids bifocals for many months.

When an increased strength of lens for close work is necessary, it is often difficult to determine which form of mounting is best adapted to a given case. This question is readily settled by the patient when it is possible for him to compare in trial frames the exact strength full sized reading lenses with the exact strength bifocals.

The bifocal set is composed of round spheres, eleven millimeters in diameter, and a pair of double spring clips which hold the small lenses in the proper bifocal position on the full sized distance lenses. These approximate the final prescription so closely that the patient is usually able to decide readily if the bifocals will be satisfactory.

So far this paper has dealt only with the various forms of hyperopic conditions. It would not be complete without referring to the testing of myopic conditions. In myopia the eye is naturally in the same state into which the hyperopic eye is placed in the two conditions. In those myopic cases in which the vision is poorer than 20/40, minus spheres are to be used until the vision is nearly 20/25. When this vision is obtained, we find the astigmatic correction with minus cylinders, as in the fogged hyperopic cases.

If the natural vision is not poorer than 20/25, it is well to do a complete fogging test, as in hyperopia. In such cases minus lenses are not to be prescribed until after being thoroughly tested by the Comfort Test. It is not uncommon for the Comfort Test to take a case out of the myopic class and put it into the hyperopic class, so that it is necessary to be very cautious in prescribing weak minus lenses. The Comfort Test is the most reliable guide in these cases.

The majority of unsatisfactory prescriptions have been those which, for lack of time or other reasons, the patient has preferred to try the lenses as found by the preliminary test, rather than to take the time to do the Comfort Test. These are to be prescribed only upon the distinct understanding that they may not be satisfactory, and if not satisfactory, a complete test will have to be made in order to get the correct lenses.

XXV.

CLINICAL OBSERVATIONS OF CATARACT OPERATIONS.*

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It is an undisputed fact that operative work for the removal of cataracts has improved wonderfully during the past few years. Some surgeons who have not received these new operations kindly have, nevertheless, realized a need for a change from the old methods. Some of the broader minded men have eagerly sought instruction along these lines and have become enthusiastic followers of the more modern operations.

While much has been written of late, for and against cataract operations, the fact remains that an operation by an expert will be a success; and, naturally, the same operation performed by a novice may be a failure; therefore, it is not the operation, but the operator, that determines the outcome.

A novice may readily become an expert operator in any of the cataract operations by taking a course of instruction under a competent man and by hours of practice upon the eyes of four-weeks-old kittens.

It will not do to say that any one operation is applicable to every form of cataract.

The author has endeavored to determine what operation is needed by studying the guiding symptoms in each special case.

The following are some of the observations drawn from actual experience:

First. The Hypermature Cataract.—The age of the cataract is probably the first symptom to be considered. In the case of a hypermature cataract, it will be safer not to operate by the intracapsular method, because the vitreous is usually fluid. Although the intracapsular operation may not result in failure, still, the fluid vitreous is very apt to escape to an extent which will result disastrously.

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*Read by invitation before the Medical Society of the State of California, at Coronado, Cal., April 19, 1917.

Second. The Immature Cataract.—If the cataract has developed to an extent which just begins to obstruct the vision, the intracapsular operation is the operation of choice; and the same remains true of any senile cataract which is not hypermature, providing there are no other complications.

Third. The Condition of the Iris.—Its movements may be very slow and sluggish, thus giving us a hint of optic nerve atrophy; and the same is true of a chronically dilated pupil. The iris may be attached here and there to the lens, and we may depend upon it that the patient has had one or more attacks of iritis and that an opaque anterior capsule forms the cataract. This usually signifies a specific history, and is not suitable for the intracapsular extraction because of the toughness of the zonular ligament. If the iris is tremulous, we can rely on this as a positive sign of degeneration of the vitreous lens or both, and that one of the capsulotomy operations will afford the greatest safety.

Fourth. The Condition of the Lens.—The cataract may develop from a central nucleus, from the periphery in striations, or as a general cloudiness of the lens without formation.

Occasionally a cloudy cataract will be seen in one eye of a young person between the ages of twenty and thirty. To operate upon this cataract by the intracapsular method may or may not result successfully, but we are pretty sure to find that the zonular ligament is so strong that too much pressure will have to be exerted in delivering it by the capsular method, so here again the capsulotomy method is necessary.

A cataract may develop very slowly or very rapidly. There seems to be no way of determining the time which will elapse before it has become fully developed. Other things being equal, the operation of choice is the intracapsular method, rather than forcing the patient to continue in blindness for an indefinite length of time.

A posterior polar cataract may present itself, and in this form of cataract we usually find the patient to be a diabetic or the eye may be highly myopic. If the history is purely that of myopia, we may operate at once by the intracapsular method, unless there are signs of liquid vitreous. With the condition of myopia in an elderly person the vitreous is almost always liquid.

Fifth. The condition of the conjunctiva is a very important factor in cataract work, and whether we find present an active or a latent infection or none at all, we should give the patient a preliminary course of treatment, and thus insure an operation free from infection.

Sixth. The blood pressure of the patient will often give us a diagnosis of arteriosclerosis; but a high blood pressure in an elderly person need not necessarily be a contraindication to the intracapsular operation, as I have operated by this method when the systolic pressure was 220 millimeters Hg., and experienced no trouble whatever. However, in a condition where the pressure is higher than this, it will be safest to operate by one of the capsulotomy methods.

Seventh. The urinalysis is an important factor, because when sugar is present we know that the cataract is the result of diabetes. Ordinarily, we reduce the sugar present as low as possible before operating, but if it is present in greater quantity than three per cent, we are bound to have a delay in the healing of the corneal wound. Consequently, in this condition, the safer operation will be one of the capsulotomy methods.

Eighth. The nervous temperament of the patient has a great deal to do with the success of the operation. If the patient is quiet and trustful, and other conditions are favorable, the intraocular operation will go along very smoothly; but should the patient be highly strung and nervous, full of doubt and fear, the capsulotomy operation is indicated.

Ninth. A history of rheumatism predisposes to trouble in most operations upon the eye, and this history has been a very valuable guide for me, as I have found that most cases which develop a condition of iritis following the operation occur in those people who admit having a history of rheumatism. If the judgment of the operator is that an iridectomy is necessary in such a case, a preliminary iridectomy is undoubtedly the most advisable procedure, after which we can safely perform the chosen operation.

Tenth. Retinal Hemorrhage.—If we can elicit from the patient a history of previous retinal hemorrhage, we are exposed to the risk of causing a recurrence of this trouble when we perform a cataract operation, since when operating we release pressure from the retinal vessels. However great the risk, we should endeavor to restore sight to the patient; but in such a case we resort again to one of the capsulotomy operations, as the presence in the eye of the posterior capsule will greatly lessen the chance of hemorrhage.

We will suppose that we had operated upon one eye of the individual by means of the intracapsular operation, and that during the operation, or soon afterward, the patient has a retinal hemorrhage. This eye may recover from its injury and have for a short time 20/20 vision, but ultimately the vision in the eye will begin to fail and the sight will be permanently impaired. Because of these facts, it will be seen that the intracapsular operation should not be performed upon the second eye, but we should instead choose a capsulotomy operation.

Eleventh. Muscæ Volitantes and Synchysis.—If the patient has a history of muscæ volitantes or of synchysis, it may be taken for granted that we have a condition of degeneration of the vitreous, and in such a case a capsulotomy will be the safer method of procedure, because we are in danger of encountering and of losing liquid vitreous if we operate by the other method.

Twelfth. A history of alcoholism and of excessive use of tobacco results, as we all know, in optic nerve affection sooner or later. To operate for cataract upon this type of an individual may result in restoring some degree of sight, but ordinarily the patient does not regain nearly all of his original sight, and naturally he is disappointed. Such a person requires patient handling. His eyesight can be improved, but we should let him know that it will be only a very limited amount and only for a short time perhaps. The least injury we can do to the iris in such a condition the better will be our chances of putting him through the ordeal without encountering an exudative iritis.

If we feel justified in operating, and for the reason stated elsewhere we would decide that an iridectomy was necessary, it would be better to perform a preliminary iridectomy.

It is true that the optic nerve will ultimately lose its usefulness in most cases, but this is no reason why we should not remove the cataract as soon as possible, and thus give the patient all the improvement of sight possible.

. In many cases of this type we can improve the condition of the optic nerve, or at least arrest the progress of its disease, but we cannot arrest the development of the cataract.

It has been the author's good fortune to have the opportunity to operate on a number of cases such as these, who had been refused operation at the hands of others for various reasons. In every case it has been possible to arrest the optic nerve atrophy by medicinal treatment, and with the cataract removed, the patient has had the opportunity to use all the vision he possesses. In some cases the vision has actually improved after a number of months of treatment.

THE IRIDECTOMY.

If we are dealing with a person who has a history of chronic rheumatism, it is quite likely that rheumatic iritis will follow a combined operation of iridectomy and extraction, and this holds good in about seventy-five per cent of such cases. A remedy is to perform a preliminary iridectomy two weeks or more before we do the extraction; again, we may extract without doing an iridectomy and start the administration of eserin promptly, in order to keep the iris away from the edges of the wound. If the anterior chamber is shallow, it will be impossible to make a smooth incision through the cornea without cutting the iris, so in this case a preliminary iridectomy is preferable.

Another good method to employ when we are extracting without performing an iridectomy is that of reintroducing the cataract knife through the wound after the extraction has been completed, and with it piercing the iris transversely to its fibers and near its base, making thus a slit-like aperture two millimeters wide. This allows exchange of the fluids of the anterior and posterior chambers and of their escape through the corneal wound, but the iris is not drawn into the corneal wound.

To my mind the ideal cataract operation is the one without an iridectomy, as the iridectomy is bound to leave an unsightly pupil in a great many instances; and to an ordinary layman that condition is always unexplainable, while to a person of experience it is always unsightly. Further than this, such a flood of light is admitted to the retina that the patient always complains of a necessity for a sunshade or sunglasses for outside purposes.

Unfortunately, if we were to attempt an extraction in every case without an iridectomy, we would encounter two difficulties: first, that of injury to the iris by means of the cataract knife, which may or may not be serious, and second, that of a prolapsed iris after our wound had healed.

Often we may judge by the history of the case that the lens is so large and hard that in attempting an intracapsular extraction we must needs do an iridectomy before we will have room enough to deliver the lens. So while I favor the operation which calls for a trephine of the iris after delivery of the lens, following this with administration of eserin in the dressing ointment, nevertheless, I realize that this procedure cannot be followed in every case, and in most cases of chronic rheumatism I gain the best results with less danger of subsequent iritis when I perform a preliminary iridectomy.

WHAT IS THE OPERATION OF CHOICE?

There can be but one answer to this question, namely, that operation which will undoubtedly produce the best visual results for the individual in question.

My preference is the intracapsular operation, because we need not keep the patient waiting until the cataract has developed. Second, we run less risk of infection. Third, we do not have subsequent needlings to perform in order to remove secondary cataracts. Fourth, recovery is rapid.

The Homer Smith method of needling an immature lens in order to artificially ripen it and so effect its delivery in entirety is my choice of operations when I have decided, for reasons stated elsewhere, that the intracapsular operation would be dangerous.

The Hess method of removing a section of the anterior capsule by means of special forceps sometimes has its advantage, but in some instances we find that the anterior capsule is so tough that we will dislocate the lens by means of our manipulations, and thus produce the condition which we have been trying to avoid—that of a removal of the capsule with the lens.

The old or regular method of removal of the cataractous lens may have to be resorted to frequently.

When attempting the intracapsular operation it is a decided advantage to have the cystotome and the small anterior chamber irrigator in readiness, so that if after we have applied moderate pressure to the cataract, it has not been expelled because of toughness of the zonular ligament, we can, with the cystotome, lance the anterior capsule, express the cataract and irrigate the anterior chamber in order to remove all remaining cortical substance.

It is not necessary for me to expound at length upon these or other commendable cataract operations, as they have been fully described by their authors and enthusiasts.

The point I wish to emphasize is that the eye operator should be familiar with the various cataract operations, practice them upon the eyes of kittens until he becomes proficient in them, and then use whichever operation the symptoms call for.

ABSORPTION OF CATARACTS.

Various solutions, such as a mixture of dionin and cyanid of mercury, succus cineraria maritima, etc., have been used in the attempt to absorb cataracts, or to arrest the development of cataracts.

I have tried a few of them, but have succeeded in only one case in satisfying myself that I had actually cleared up a beginning opacity. In this case I used eye drops composed of dionin and mercuric cyanid together with frequent applications of electricity, in the form of high frequency.

I have not made a practice of subconjunctival injections because of the extreme pain which they cause and the uncertainty of their success.

My observations have led me to believe that an early operation is the only satisfactory method of dealing with cataracts.

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XXVI.

THE USE OF SOPHOL IN THE PREVENTION OF OPHTHALMIA NEONATORUM.*

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Half a century ago child-bearing paid a heavy toll to the ravages of the gonococcus of Neisser. In some quarters gonorrheal ophthalmia occurred in twenty-four per cent of all living babies, and in spite of the active measures instituted early, thousands of babies were rendered permanently blind. All consideration was directed to active treatment, and no thought was given to prophylaxis. Today the question has resolved itself into one of choosing the most suitable agent to be used as an efficient preventive of this serious infection, and of rigid enforcement of its routine application.

The first effort directed towards prophylaxis was in 1875, when Bischof recommended disinfection of the vagina with carbolic irrigations before labor, and irrigation of the eyes of the newborn with a salicylic solution, thus reducing the morbidity greatly (2.6 per cent). But it was not until 1880, when Credé introduced into his clinic in Leipsic the practice of instilling into the eyes of the newborn a two per cent solution of silver nitrate, that a morbidity of from twelve to fifteen per cent, which he had experienced up to that time, was practically obliterated. This procedure, which bears Crede's name, is still the method of choice in most of the obstetric clinics of the world, a one per cent solution being used instead of two per cent. Credé's recommendation led to the almost universal adoption of the method, and favorable reports were soon forthcoming from all sides. In his own clinic, in the four years 1880 to 1884, he reported 1160 cases with only two cases of ophthalmia, a percentage of 0.0017. Not only the gonorrheal, but the simple ophthalmias almost disappeared as well.

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*Read before Michael Reese Hospital Clinical Society.

In Dresden, likewise, the efficacy of the procedure was strengthened, 30,000 cases having been reported without a single case of ophthalmia neonatorum. In Stuttgart, where a morbidity of from 8.7 per cent to 14.3 per cent was reported in the four years prior to the inception of this method of prevention, not a single case occurred in 1881, the first year of its employment. Hecker summed up 3,971 living births for the ten years ending in 1880, an average number of 397 cases per year, carrying an average morbidity from ophthalmia of 24.3 per cent; in 1881, following Credé's technic, no case of ophthalmia developed in 361 births.

As the years passed it was found that while silver nitrate protected in the majority of cases, still a considerable number of cases developed. Thus in 1896 Köstlin compiled statistics covering 17,767 births before the use of the Credé prophylaxis with a 10.01 per cent morbidity, and 27,747 births after its introduction with a morbidity of 0.09 per cent. While this was a tremendous step in advance, it still was not absolute prevention; objection to the use of nitrate of silver began to accumulate also on the ground that it is too irritating to the eyes even in a one per cent solution. Fear was expressed that permanent injury might be wrought to the cornea and conjunctiva, and suggestions were made that the less irritating preparations of silver be used. Among those suggested were argyrol, protargol, sophol, silver acetate, collargol and albargin. Argyrol, collargol and albargin were soon found to be the least effective and were practically abandoned by all. Protargol was still used in some clinics, but the three preparations claiming supremacy were silver nitrate, silver acetate, and sophol. Those who opposed the use of silver nitrate, objected on the basis of its intense irritation, due to decomposition with the liberation of minute quantities of nitric acid in the eyes. To determine whether this really produced actually harmful lesions in the eyes, Credé-Hörder carried out an extensive research. He dropped into the eyes of rabbits one to five drops of 2 per cent $AgNO_3$, 1 per cent $AgNO_3$, 1.3 per cent Ag acet., 1 per cent sophol. At various stages of irritation and repair he removed the orbits intact, preserving the relation of the lids to the bulb. These were hardened and studied in serial sections for histologic changes in the conjunctiva and cornea. Likewise, the eyes of newborn babies who died in the first few days of life as a result of birth trauma, asphyxia, etc., were removed and studied. In no instance was evidence of permanent injury found, and often only the palpebral conjunctiva was affected. The cornea always remained unchanged and in a few days the integrity of the conjunctiva was fully restored. Silver nitrate caused the most intense reaction, silver acetate the next, and sophol the least. He concluded, on the basis of this histologic study, that the three above named preparations, in the proper dosage and with proper technic, are about equally efficient and never cause serious damage to the eyes; that prophylactic instillation of one of them should be made compulsory.

In order to determine which preparation was considered most adaptable for compulsory prophylaxis, a poll was taken of the leading ophthalmologists and obstetricians in Germany. Of sixteen, nine advised $AgNO_3$ 1 per cent or 2 per cent; two advised Ag acet., 1 per cent; one advised sophol; four did not reply. Two advised sophol as second best. Of fifty-one obstetricians, thirty-seven advised use of silver nitrate; four advised silver acetate; five advised sophol; three protargol 10 per cent to 20 per cent; one, boric acid 3 per cent; one did not reply. Four advised sophol as second best. Summing up, two-thirds to three-fourths of the clinicians consulted chose $AgNO_3$ as the preparation best suited for compulsory prophylaxis. Likewise, of twenty university maternities, nineteen replied in favor of compulsory instillation of silver.

In spite of the above statements, we believe the ideal prophylactic is still to be found. That is, one which, according to Ehrenfest, not only destroys the gonococcus in the conjunctival sac, but also does no harm to the eye, and which causes no pain. Sophol is the one preparation now in use which most nearly fulfills these requirements.

Sophol is a silver methylene nucleinic acid compound, manufactured by Bayer and Company. It is a yellow powder with a metallic taste, containing no less than twenty per cent silver. It is readily soluble in water with a faint alkalin reaction, but is insoluble in alcohol and ether. It must be protected from the light to prevent decomposition. Only fresh solutions should be used, as decomposition products may cause undue irritation. This is guarded against in our work at the Michael Reese Maternity by employing dark amber bottles, which are refilled with a freshly prepared solution each fourth day.

A proper technic of instilling sophol is essential to success. This requires the assistance of two persons, one to pry apart the lids, using small pledgets of gauze or cotton, and the other to administer the drug. One drop of a five per cent solution is instilled directly into the eye, and a second drop placed at the inner canthus when the lids are closed. This insures disinfection of the lid edges which might carry infected material, later to be wiped into the eyes. Following the above technic for the past four years we have had in the Michael Reese Hospital but two cases of gonorrheal ophthalmia among 5,257 births. Thus our morbidity percentage is 0.0003. This is extremely favorable when compared with statistics of the four years immediately preceding, during which time silver nitrate was employed according to the Credé technic. In the latter there were five cases among 3,580 births, a morbidity percentage of 0.0014. This figure is almost identical with that of Credé's own series referred to above. While both of these percentage figures appear very small, it is apparent that our morbidity was reduced four-fifths by the use of sophol.

Von Herff of Basel, the strongest advocate of sophol, reported 8,000 babies without a single case of ophthalmia neonatorum in the Kanton of Solothurn, where at least 1,000 of the mothers were gonorrheal.

In analyzing our own two cases, which developed in spite of our use of sophol, one is worthy of consideration in estimating the value of a prophylactic. This case, No. 65537, Para viii, aged thirty-six years, Russian, was admitted to the Maternity for confinement November 9, 1913. Her previous history was negative. Seven full term children were delivered at home by midwives. The one under consideration was born uneventfully and the eyes given the usual sophol treatment. There was no sign of infection until the eighth day, when a smear from the eye, which was discharging slightly, was positive for gonococci. Smears taken from the mother's vagina also contained gonococci. In this case sophol probably protected the eyes from birth infection, and the eyes were subsequently infected when the effects of the sophol had disappeared. It is not infrequent to find service patients handling the vulva pads or scratching the genitals, and it is easy to understand how a patient with a gonorrheal vaginal secretion could transfer infection to her own eyes and the eyes of her babe with her hands.

Dr. Frank Allport, chairman of the Conservation of Vision Committee of the American Medical Association, stated that silver nitrate in one or two per cent solution is the only reliable medicine employed as a prophylactic agent at birth, and that other silver salts are not sufficiently powerful to prevent ophthalmia. We believe, from our experience of the past four years, that this statement requires modification. Sophol in our hands has proven four times as efficient as a prophylactic, and we would urge upon the profession its broader application. Now that compulsory prophylaxis is almost universal in this country, thanks to the efforts of the above named committee and to the Society for the Prevention of Blindness, the problem resolves itself into one of selection of the most efficient drug, and of the enforcement of the compulsory instillation. In conclusion, we agree with von Herff, Lehle, Zeman, Willim and many others, that five per cent sophol should be employed more generally in routine prophylaxis of ophthalmia neonatorum.

The laborious task of reviewing the maternity records was begun by Dr. Julius E. Lackner, whose results are incorporated in this report. I wish here to express my sincere thanks for this assistance. Also to my chief, Dr. Lester E. Frankenthal, for the opportunity of presenting the report, and for valuable assistance in preparation of it, I offer my humble appreciation.

XXVII.

OPERATION FOR ANTERIOR SYNECHIA, WITH REPORT OF CASES OF SECONDARY GLAUCOMA AND STAPHYLOMA IN WHICH IT WAS USED.*

C. G. Darling, M. D.,

OPHTHALMIC SURGEON, COOK COUNTY HOSPITAL,

Chicago.

The formation of anterior synechia after perforating ulcers or injuries of the cornea often leads to a secondary glaucoma, with or without the formation of a staphyloma of the cornea.

This is particularly true if the area of incarcerated iris is large or the pupillary area is the part adherent.

The operation for these conditions of which I wish to speak consist in doing Heine's cyclodialysis operation in the regular manner opposite the area of iris to be freed. This operation, as you remember, consists in making a small conjunctival flap about a centimeter from the limbus. An incision five or six millimeters long is made through the sclera parallel to the limbus and about a centimeter from it; this incision can be made with a keratome, using sawing movements, care being taken just to work through the sclera and not to cut the choroid.

Now a spatula is introduced between the choroid and the sclera and worked forward into the anterior chamber.

The spatula which I use differs from the usual one, in having a small cutting edge just back of the end on each side. The spatula is passed forward, separating the iris from the cornea, and the anterior synechiæ are cut free from the cornea by using the small cutting edge of the spatula, the posterior surface of the cornea being hugged by the spatula all the time. If the corneal scar is in the pupillary area, an optical iridectomy can now be done by cutting down on the spatula well back in the limbus and enlarging the incision with scissors or canaliculus knife. Or one can wait and do the operation in the regular way at some later date, after the formation of an anterior chamber. This makes it easy to do an iridectomy in complete obliteration of the anterior chamber with staphyloma of the cornea.[1] When there is a large staphyloma and only a very narrow rim of cornea, the operation may have to be done from two or more different points to free the entire iris root.

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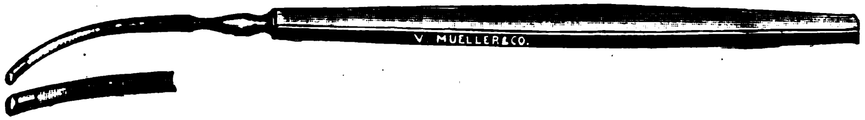
*Read before the Eye Section, Illinois State Medical Association, Bloomington, Illinois, May 9, 1917.

I believe the operation described has some advantage over other operations when dealing with large anterior synechia, the principal advantage probably being that the iris is freed from the cornea well back to its root, the anterior chamber as a result being completely reformed. This will not be done by iridectomy in these cases, as the iris root is adherent to the cornea, and also iridectomy, when the anterior chamber is absent, is very difficult to do.



I wish to very briefly report three cases in which this operation was used.

Case 1.—Patient, male, aged thirty-seven years, entered Dr. Clark's service at the County Hospital, complaining of great pain in the left eye and side of head. The interne gave several injections of morphin, which did not control the pain.

Examination showed a large adherent leucoma of the cornea involving the center one-half of the cornea. Tension, eighty millimeters. No light perception. The operation was done by freeing the iris from the cornea as described, no iridectomy being done. Tension remained from ten millimeters to fifteen millimeters. Eye kept quiet. No light perception.

Case 2.—Patient, male, aged forty-five years. Following large ulcer of cornea with perforation, patient developed a staphyloma of the cornea of the right eye. On the nasal side there was a small area of clear cornea about two and one-half millimeters across; tension, plus. On account of staphyloma, tension not taken with tonometer. Vision, light perception. Operation done combined with iridectomy, behind clear area of cornea. Result: Flattening of staphyloma; vision, fingers at ten feet. Tension, fifteen millimeters, two months later.

Case 3.—Patient entered my service at County Hospital with perforated ulcer near center of cornea. Tension, sixty millimeters after healing of ulcer. The patient was a Pole, who spoke no English, and was very hard to control through interpreter. After making the scleral cut and introducing spatula about two or three millimeters, patient suddenly raised his head and the spatula tore the choroid and vitreous prolapsed. I did not proceed to pass the spatula into anterior chamber, but replaced my conjunctival flap. Eye did not become inflamed and has remained quiet. Tension remained down for two weeks, and then became slightly increased, this lowering being probably due to injury to ciliary body and the posterior sclerotomy. Vision, light perception, as before. This attempt at operation was done over one month ago; if eye remains quiet, will do an operation to free the iris under a general anesthetic.

REFERENCE.

1. **Darling, C. G.: A Method of Operation in Complete Obliteration of the Anterior Chamber, with Report of a Case of Corneal Staphyloma. Ophthalmic Record, February, 1917.**

XXVIII.

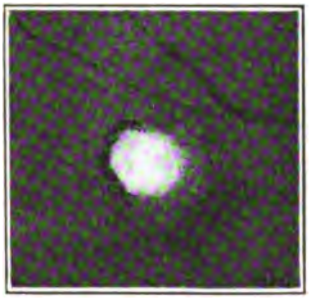
CHOROIDITIS OF THERAPEUTICALLY PROVEN DENTAL ORIGIN.

HARRY S. GRADLE, M. D.,

CHICAGO.

This short clinical report is published without comment merely to add to the rapidly growing number of cases of uveal tract inflammation with a definite etiologic factor.

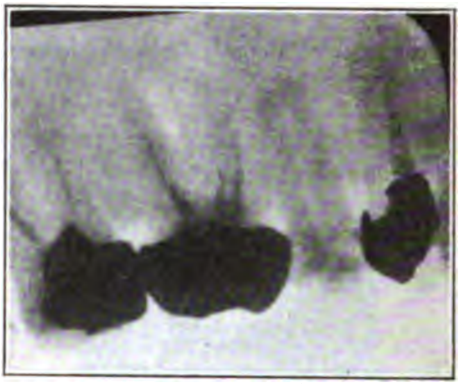
H. G., aged thirty years. Scintillating spots before the left eye and gradual reduction of left vision for the past year. Denies lues.



Status Praesens.—Right eye normal. Vision normal. Left eye externally normal. Vitreous hazy, but no formed floaters. In the upper nasal quadrant of the fundus is an obliquely oval area, five disc diameters in size. It is pure white and has black pigmented edges upon the peripheral side. The central border is fluffy and shows evidences of an inflammation actively progressing toward the disc. In the center of the area are three oval white spots that look like "Drusen." The retina peripheral to the area is normal, but that bordering upon the central edge is fluffy and somewhat edematous. The rest of the fundus is normal. The vision is 0.5.

A roentgenogram of the teeth revealed a small abscess involving both roots of the right lower first molar. This tooth had been crowned some years previously, but had never given trouble. The crown was removed and both root canals drilled out. The abscess was then treated with formocresol and drained.

Some three weeks later the patient reported that the eye was no longer troublesome. On examination the vitreous was found to be perfectly clear. The choroiditic area was pure white, but the central edge was now clear cut, and the neighboring retina appeared normal. The spots within the area had disappeared, and choroidal vessels could be seen coursing through. The vision was normal (1.0).



Comment upon this case is scarcely necessary. The only treatment of any sort given was that of the root abscess, which appeared to be the focus from which the disturbing toxins were generated. An unusual feature was the inflammatory border which was progressing toward the disc, following the retinal lymph stream, and the prompt cessation of the progression after drainage of the offending focus.

XXIX.

GLAUCOMA AND AUTOINTOXICATION.

CLARK W. HAWLEY, M. D.,

PROFESSOR OF OPHTHALMOLOGY, POST-GRADUATE MEDICAL SCHOOL,

CHICAGO.

I shall present for your consideration something new in the report of four cases of glaucoma that have been under my care for the past year. I shall not go into tedious detail of the cases, but give them in a manner to bring out possibly some new thoughts on glaucoma. The idea is so new that I hesitate to more than present the facts and let you draw your own conclusions as to the value of them.

The time elapsed in some of them is so short that no positive conclusion can be drawn, and the number is too limited to be certain of ideas of value, yet my results have been so far in advance of anything achieved before, that I feel there is food for thought in the report. For twenty-five years I have handled my cases in the usual way, with the results that all are familiar with. But the improved results, by the addition of this new treatment, justify me in reporting them early.

The profession has for long been casting about from one theory to another as to the cause of glaucoma, until the field has about been covered. Some ideas have lasted longer than others.

We are all agreed that either the outflow is obstructed or the inflow is increased. But as to the cause of this no one has advanced an idea that has been accepted as filling the bill. I believe I can bring out a theory that will fit either of the above facts, and I am only too sorry that I cannot present it in a more convincing form. But perhaps someone else may take the idea and develop it to a positive conclusion. The treatment points to infection as the cause of some of the cases of glaucoma at least. The trend of medical thought is along these lines now.

Just a year ago I received a call to see a patient in a neighboring village who they announced over the phone was suffering from iritis. I found my patient was a lady who at the breakfast table found that she could not recognize her friends about her. I found her in bed with all the symptoms of acute glaucoma—nausea, loss of vision in the left eye, increased tension and dilated pupil. She had diagnosed her own case as one of iritis, as the symptoms were similar to an attack she had a year or so before. They called up a Chicago oculist who summers in the next town, and he had advised the use of atropin. So much for self-diagnosis and telephonic treatment of a serious eye lesion.

She had lost the right eye some time before, as an iridectomy had been done, but without result favorable to vision.

I at once prescribed for her, and in getting a more complete history of the case I was in some way impressed with the idea that she was suffering from an extreme case of autointoxication. Suspecting the source to be the lower bowel, I gave them my usual instructions to be followed in such cases, not waiting for the urine test, which was carried out later on and confirmed my suspicions fully. She improved so rapidly, much more so than any case I have had under myopics, that I was surprised and wondered how much the autointoxication had to do with it. As soon as the patient was able to come to my office I found vision 20/80 in this eye, a very little in the other or lost eye. In a very short time vision was 20/40, and came on rapidly to 20/20, and the near vision also became normal.

The patient, after a year of treatment, considers herself cured. But that is another matter for future development. The treatment for the autointoxication is still continued, as it is impossible to cure a case of this kind of infection in a short time. The bowel will take on a normal condition only after months on a very restricted diet and bowel flushings.

Not enough time has elapsed to make a positive statement, but of this fact I am sure, that in my twenty-five years of eye work I have not had such results as in this and the following cases, so that I am justified in at least thinking very seriously of autointoxication as having something to do with the cause of glaucoma. I was led to this idea by my experience with a number of cases of iridocyclitis and chronic cyclitis which I published two or three years ago.

The next case was an old lady of sixty-five years, who was brought to me with a very bad case of glaucoma in the left eye, which had been neglected, and as the eye was now practically destroyed, I advised removal, to which they readily consented. I found a mild glaucomatous condition in the other eye, with considerable loss of vision. After an examination of the urine, it was evident that she was suffering from a severe autointoxication. She was an excessive meat eater. I immediately instituted treatment of an absolutely nonmeat diet and daily bowel flushings. The improvement in vision was marked at once, though not as rapidly as in the former case. The patient is a rather unruly one, and would break away from my instructions, eating meat on the sly. Then she would show up in my office with an increase in her trouble. After a good scolding, at the next visit there would be an improvement. This case is the only one that has not been marked, but yet it is better than with dionin and eserin alone.

The next patient was seen in consultation with my assistant, Dr. Campbell. Like the above case, the right eye had been so neglected before treatment was instituted that the eye had to be removed. After several months the other eye was suddenly attacked with glaucomatous condition, loss of vision, rainbow colors about the light, and increased tension. She was put upon the same treatment, and by the third day the rainbow colors had disappeared, vision had been very much improved and tension was reduced. An examination of the urine showed marked autointoxication. On account of fear of losing her eye, she has been very faithful in her treatment and also the diet. After several months of this treatment, which is still being continued, Dr. Campbell reports the condition as very satisfactory. The details I cannot give; in fact, in none of the cases do I care to burden this paper with them, as they are familiar to you all. What I want to bring out is that I am getting unusual results from a very vigorous care of the lower bowel. I always insist on my patient following instructions implicitly, or I do not want to have anything to do with the case.

Another case. Twenty-two years ago I removed Mrs. S.'s eye for a severe specific trouble, from carelessness and neglect by the attending physician. When the right eye became affected I was called into the case and found a commencing corneal ulcer. I removed the left eye, and by the most vigorous treatment saved the right eye. She was pregnant at the time, and very vigorous treatment of the vaginal tract saved the baby's eyes. She has had no trouble until lately. Between Christmas and February 16, 1917, she had blurring spells frequently during the day, sometimes lasting all day. The last two weeks before I saw her these occurred every day. Upon examination I found a shallow anterior chamber, cornea slightly hazy, tension increased, and with difficulty the fundus could be seen. I could recognize the disc sufficiently to see that there was commencing cupping, vision 26/100. I immediately put her on bowel flushings and a strictly nonmeat diet without any urinalysis. By this time I felt so confident that autointoxication was possibly the source of many glaucomatous attacks, that I did not use dionin or eserin for several days. The day I saw her was the last attack that she has had up to the present time. Between the first and the fifth day she had no treatment with my miotics. The bowel flushings and nonmeat diet alone stopped the attack. At this time I instituted treatment with dionin and eserin, and she has been very faithful in following my instructions. Here you have the nearest approach that I am able to give up to this time of the possible value of autointoxication as a cause of glaucoma. Yet we should not neglect the help of the dionin and eserin, and even an iridectomy as a last resort and help. I am sorry now that I did not continue this case without the eserin and dionin. Yet the result is much better than I have ever been able to obtain in so short a time with my miotics alone. Her vision now is 26/30, and she has had no return of the attacks and the anterior chamber is slightly improved. A singular fact is that the first three cases had lost one eye by neglect of a glaucomatous condition, the fourth having lost the other eye many years before.

Since the commencement of my paper I have a new case, and one that if it follows the course of the others will be a strong point in confirmation of my theory. The patient has been suffering for six years with attacks of glaucoma, first in one eye, for which an iridectomy was done. She has been able to control the glaucoma with eserin only temporarily. If by treating the autoinfection I succeed in producing an entirely new condition, I shall then have an added point in my favor.

Miss A., aged forty years, about six years ago first noticed blurring at study and rainbows about the lights. She was treated by Dr. Knapp of New York, who performed an iridectomy on the left eye. Lately has had many blurrings and rainbows about the lights with the left eye and more with the right. Tension increased slightly. The tension and rainbow colors she has always been able to temporarily control with eserin. I hope to do better than this for her if she will follow the treatment for several months or a year, like my first patient. I have had her on eserin, dionin, nonmeat diet, and bowel flushing. At first, she said that there was very little improvement, if any. The last time she reported, she said that there was marked improvement in all the symptoms. This case has been under treatment so short a time that not much can be expected as to results. But if in a few months I can bring about a cessation of the attacks, I shall be encouraged to continue treatment and expect as good results as I have obtained in the two other cases.

In conclusion, if my results in the future are what they seem now to promise to be, at least some of our cases of glaucoma are due to poisonous matter affecting the outgoing canal, producing slight inflammatory conditions which lessen their caliber, thus producing an imbalance between the inflow and outflow of the secretions of the eye; or possibly, inflammatory trouble about the ciliary vessels produces sufficient irritation that there is an increased flow into the eye, the toxic material coming from the lower bowel. If cyclitis is so produced, why not glaucoma? There is no reason not to consider it as a product of infection.

I very much hope that the future progress of my cases, and perhaps attempts by others along the same line, may show results that are valuable. There is one feature in these cases that may be puzzling, and that is the rapidity with which results are shown after commencing bowel flushings and nonmeat diet. The best way I can show this is by some experiments which I carried out on myself when suffering from chronic cyclitis with two large collections of opacities obscuring central vision of both eyes. In less than two months after commencing treatment of my autointoxication, the opacities had almost entirely disappeared. After nine months of the strictest kind of care, I thought possibly I might return to a meat diet and reduce my bowel flushings to two or three times a week instead of daily, so I commenced eating meat two or three times a week and reduced the other care as well. After about three weeks of this kind of diet the opacities became apparent again. I immediately returned to my daily flushings and an absolutely nonmeat diet, and in four days the opacities had disappeared. This shows how rapidly nature can work under favorable circumstances.

I would call your attention to one fact, and it is this: that I absolutely refuse to look after any patient who refuses to follow my instructions absolutely, and it is only under this strict regimen that results can be accomplished.

If cyclitis is caused by infection from various sources, then why not glaucoma? And I believe that in the majority of cases we will find the lower bowel the focal starting point. I was led to this idea by my own chronic cyclitis getting well under treatment for a severe case of autointoxication from the bowel, following a severe attack of erysipelas. Glaucoma may be caused by infection from other sources than the bowel, but they will be found the rarer cause.

XXX.

DO MOVING PICTURES INJURE THE EYES?

C. A. Bahn, M. D.,

New Orleans.

It is estimated that there are fifteen thousand moving picture theaters in this country with a daily attendance of ten million.[1] The small cost, short duration, constant performance, mental and physical relaxation, interesting and instructive portrayal of science, comedy, tragedy, romance, history, and morality make the movie our national amusement.

The ready adaptability of the moving picture may be appreciated when we consider its application to the field of botany and zoology for the study of plant and animal life; to physiology, in the functional studies of the various organs; to surgery, in the study of operative technic; to medicine, in observing the changes in disease; to efficiency, in the elimination of unnecessary motions; to history, in the portrayal of important events for future reference; to salesmanship, in pictorial description.

Photographs of a moving object, taken and displayed before the eye at the rate of about sixteen per second, are interpreted as having continuous motion. The sight mechanism requires about one-twelfth of a second to record a distinct mental picture of a moving object. Faster impressions are merged into continuous motion. For continuous and natural motion, pictures must be photographed and projected at exactly the same rate. Slower photography or faster projection gives the jerky automaton motion; faster photography or slower projection, the uncanny, walking-on-air appearance.

The source of illumination used in projection is a limelight or an arc, usually of about two thousand candle power, focused on the distant screen by a reflector and a series of lenses. Interposed is the celluloid or composition film, which ranges from about five hundred to twelve thousand feet long, and has photographed on it, by the primary negative, the series of pictures, each three-quarters by one inch.

By means of perforations on both sides, sprockets, pressure rollers, and other mechanism, the film is drawn downward over the lens aperture at the proper and uniform rate. Each individual picture is absolutely still while being projected. Then, during an interval of about one-one-hundredth of a second, by means of the rotary shutter or electric cut-out, the light is shut off from the screen, while the next picture is being drawn before the lens aperture. Even the slightest interval in which light passes through the light aperture, without a film picture interposed, causes flickering. Flickering, white balls or stars, lines, etc., are due to defective mechanism or film. They greatly increase ocular fatigue and are harmful and unnecessary. By means of the lens system the film picture is magnified about ninety-five thousand times on the screen,[7] and imperfections of film or mechanism correspondingly.

How are moving pictures seen and interpreted? Visible light is produced in the human eye by ether waves, varying from approximately one-three-hundred-thousandths to one-six-hundred-thousandths of an inch long,[8] and in frequency, from twenty million of million to four hundred million of million per second.[10] Objects are focused by the dioptric apparatus on the retina, inverted. Here, neurochemic changes transform light rays into specific nerve stimuli. These are carried along the optic nerves, either directly or in relays, to the primary or lower visual cortex in the occipital lobe. This represents the simplest visual concept. This concept becomes more complete and complicated by association with the higher visual and sensory areas.

A certain proportion of the bodily nervous energy is required by the sight mechanism to functionate properly. Any defect of the sight or moving picture mechanism increases the eye load, and, therefore, the relative proportion of eye energy necessary to maintain distinct, comfortable sight. Either the sight acuteness and comfort can be maintained under these adverse conditions, or not. If not, unpleasant symptoms result, which can be attributed, in the functionally perfect sight mechanism, to fatigue or its accompanying vascular changes.

Among eye symptoms which have been attributed to moving pictures are:

1. Redness of conjunctiva and lid.
2. Lacrimation.
3. Fatigue: Muscular, retinal, and ciliary.
4. Pain of varying intensity in and about the eyes, including itching and burning.
5. Headache.
6. Dizziness.
7. Blind spots.
8. Electric ophthalmia: Redness and swelling of lids and conjunctiva from exposure to intense illumination. It is occasionally seen in moving picture operators and actors, and subsides in a few days.

The effect of the moving picture on the eye depends upon two things:

1. The moving picture.
2. The eye.

Among the moving picture factors which influence the effects on the eyes are:

1. Film: Speed and character of motion portrayed, character of action portrayed, color values, actual colors, distinctness, contrast, focus, condition.
2. Projection: Mechanism and condition of lenses, rate and variation of speed, focus, intensity and variation of illumination.
3. Screen: Reflection.
4. General conditions: Ventilation, general illumination, comfort, and other entertainment.

The eye factors involved are:

1. Sight mechanism: Keenness of sight, energy required to maintain maximum sight, binocular fixation, and interpretation of pictures.
2. Position of person in theater: Pictures are least tiring when viewed from thirty to one hundred feet from the screen. Distortion is increased with the angle formed by the line of projection and the line of the observer's sight.

3. Method of viewing pictures: Any person can tire the eyes unduly by riveting the eyes and attention on one object on the screen for even three minutes. For minimum fatigue, one should view the pictures as a whole with eyes relaxed as much as possible, and should either close the eyes or look at something beside the screen every few minutes. Musical or other varieties of entertainment rest the mind and eye—sometimes.

4. Mental effect: Generally speaking, moving pictures are more or less restful. The looking upward, slight illumination, and restful comfort tend to make one sleepy.

5. Decreased winking.

6. Personal equation.

There are in the human body no absolute functional standards. In nature, nothing just happens. There are, however, some eyes, though apparently anatomically and functionally otherwise perfect, which may have a low tolerance for bright light, apparently inexplicable. These eyes may have less discomfort with amber, smoke, Crookes' A or B, Noviol, Chlorophyl, or other tinted lenses.

In the great majority who complain of unpleasant symptoms following moving pictures, under favorable conditions, the eye is more often at fault than the picture. Refractive errors, muscle imbalance, defect of vision or fixation, or disease, increase the difficulty in maintaining a maximum distinctness, endurance, and comfort. The moving picture is, under favorable conditions, a slight sight test, and often attracts attention to preexisting ocular defects. If the eyes cannot stand the test, unpleasant symptoms result.

Some pictures are not presented under the most favorable conditions. Indistinct, worn, or scratched films, objectionable screens, poor projection, variable, too bright, or dim illumination, and inexperienced operators, produce pictures which will cause unpleasant or even injurious effects in any eye, normal or abnormal. Any or all of the above causes greatly increase the ocular fatigue and cause unpleasant symptoms.

Practically all of the objectionable features of the moving pictures have been removed in the highest class theaters. The seats are comfortable; there are no seats in the house with over thirty degrees obliquity with line of projection; the indirect illumination is sufficient to be restful, and still not make the pictures in too great contrast; the nearest seat is more than twenty feet from the screen, the farthest, less than one hundred and fifty; the line of the observer's sight is practically the same as the line of projection of the pictures; a proper temperature is maintained; forced ventilation is used; mechanical defects are eliminated from the projector; only perfect films are used; the screen has no unpleasant reflexes; the pictures are projected at a proper and uniform speed; intervals are given between the pictures, in which no pictures are shown, and in which other entertainment, such as music or vaudeville is offered.

CONCLUSIONS.

1. Moving pictures, under favorable conditions, do not cause as much fatigue as the same period of concentrated reading.
2. Most persons who complain that moving pictures cause ocular discomfort have some ocular defect.
3. Moving pictures, under favorable conditions, act as a slight test of distant eye endurance. A person with no defect of the sight mechanism should be able to enjoy at least four sittings of one and a half hours each, per week, with no discomfort.
4. Under unfavorable conditions, moving pictures cause increased fatigue which, if continued, produce symptoms that are unpleasant and may be harmful.
5. By staring fixedly at one object on the picture for a prolonged time, fatigue is greatly increased and unpleasant symptoms are produced. A person should not stare at any one object, but should try to look at different parts of the screen, and should either close the eyes or look about the theater for a few seconds about every five minutes.
6. Every person has an individual standard of eye endurance. When your eyes become fatigued in a picture theater, leave. Within bounds, either your eyes or the pictures are at fault. If the pictures, go where they are presented under more favorable conditions; if your eyes, see an oculist, that he may study and eliminate the cause.
7. A review of the literature to date records no permanent harm to the eyes from moving pictures. The fact that ten

million persons enjoy moving pictures daily with no definite reports of specific harm or injurious effect, and with but few complaints of slight inconvenience, proves that the moving picture can have no injurious effect upon the eyes.

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XXXI.

INTRAVENTRICULAR INJECTION OF ANTISYPHILITICS IN PRIMARY OPTIC ATROPHY—REPORT OF A CASE.

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The epoch-making innovation of the treatment of primary optic atrophy by means of intraventricular therapy, presented at the Detroit meeting of the American Medical Association, 1916, by Dr. Mark Schoenberg, of New York, represents an advance in ocular therapy as attractive as it is daring.

It means, doubtlessly, a decided advance, since it promises a ray of hope in a hitherto dark and hopeless field of pathology, from a prognostic point of view.

The fact that all our medication has been apparently directed against an impermeable wall, as the author convincingly demonstrated by his work upon the lower animals, accounts for our complete failure in making an impression upon the so-called primary atrophies of the optic nerve.

We know now the spirochetes exist in the central nervous system, cerebrospinal fluid, and in the blood of tabetics and paretics. Upon these facts one has a logical basis to reason that they can and will be found in the optic nerve at some not distant date.

The fact that the endothelium covering the choroid plexuses has the peculiar function of acting as a barrier to many drugs, particularly those used in the treatment of lues, must attract our attention.

The further fact that the cerebrospinal fluid is formed in the choroid plexuses, and circulates through the spaces of the brain down to the spinal canal (the direction of the current is still disputed), leads to the conclusion that injections into the spinal canal would be compelled to rise against this current, even if the above mentioned barriers were not present, demonstrating the almost hopeless task of medication reaching the optic nerves.

These facts naturally made a deep impression upon me, as I am sure they have on all who have had the humiliating experience of being compelled to remain helpless while this class of unfortunates progressed from bad to worse to the climax of complete blindness. I am sure everyone who has examined this work carefully will agree that the optic nerves can be reached directly by the intraventricular injection, but whether or not direct application of the medicament is an advantage over the old method in this particular disease the future only can determine.

This status of therapeutic uncertainty virtually makes it incumbent on every worker to contribute his experience to the literature, for the purpose of furthering the cause by shedding all possible light on the still experimental features.

This new treatment can, at the very worst, be no more of a failure than any of the methods in vogue, but the fact that it contains certain elements of risk necessitates close attention to details.

The following case, which I desire to place on record, I believe merits scientific interest, in spite of the fact that the therapeutic result may appear discouraging. At this time I desire to acknowledge an indebtedness to Dr. George F. Suker, of Chicago, who encouraged me to give Dr. Schoenberg's preliminary work a thorough trial, and through whose encouragement I felt morally justified in resorting to this rather daring method of treatment.

CASE REPORT.

Mr. V. D. presented himself at the Illinois Charitable Eye and Ear Infirmary, on March 27, 1916, and gave the following history: Age, thirty-five years; married; has three children, all healthy and living; Italian laborer. Contracted lues about eighteen years ago. Complains of failing vision in right eye.

Examination.—Facies and mentality apparently negative. Right pupil, four millimeters. Left pupil, two and one-half millimeters. Right eye reacts sluggishly to light. Left eye apparently normal. Cornea and anterior chamber negative. Vision, right eye, 20/120; left eye, 20/20 — 2. Dilatation with homatropin, equal and normal.

Fundus Examination.—Right eye, beginning primary optic atrophy. Left eye, disc normal.

Wassermann on the blood gave four plus positive.

He was placed upon inunctions of mercury and iodids internally.

Perimetric field showed in right eye marked concentric contraction. Left eye, no demonstrable changes.

Neurologic Examination.—Patellar reflex barely perceptible. Rhomberg and coordination tests and gait, negative.

No perceptible change was noted for some time, and then vision gradually diminished in right eye until he was totally blind. About six months later, vision showed decline in the left. He had been receiving very strenuous treatment during all this time with mercury, iodids and salvarsan, but in spite of all our efforts the decline became very rapid, so that he was compelled to give up his position. At this time his vision in the right eye was nil; left eye, 20/100; right pupil widely dilated, left almost so. Argyle-Robertson pupil now present; patellar reflex absent.

After explaining to him and his family our apparent inability to arrest the progress of his disease, I suggested the intraventricular injection as possibly offering some hope, but must admit that at this time I did not urge the procedure. The suggestion, however, was rapidly accepted, and on November 16, 1916, he was taken into the hospital for an intraventricular injection of mercury.

Examination at this time gave following data: Right eye, vision nil; left eye, 20/100. Tension, right eye, 17; left eye, 22. Blood pressure, 125 millimeters. Right pupil does not react to light. Left pupil does not react to light, but both react to accommodation.

November 17, 1916. After the usual surgical preparation and skin incision, a half-inch trephine was made at a point corresponding to a line drawn vertically upward from the junction of the frontal and nasal bones for three inches, and then drawn horizontally for about one and one-half inches to the right. The button of bone was removed and all hemorrhage arrested. The dura was now exposed, and a trochar with obturator was slowly passed through the brain tissues at an angle of about forty-five degrees to the horizontal plane and about ten degrees forward, after entering the lateral ventricle, which will average about six centimeters from the surface. The obturator was then removed and about twenty cubic centimeters of cerebrospinal fluid withdrawn. To one-half of this was added 1/70 of a grain of bichlorid of mercury and slowly reinjected. The skin flap was replaced, sutured, a bandage applied, and patient returned to bed. The following day patient in bed, "feeling fine," as he expressed it. Temperature and pulse normal.

November 28, 1916. Vision left eye, 20/70.

November 29, 1916. About two hours before operation, patient was given a hypodermic injection of morphin, grain one-eighth, with scopolamin 1/150. After the usual preparation, we made another injection, this time under local anesthesia. The injection was made through the skin, but we could not at this time remove more than five cubic centimeters of fluid, which we reinjected with the addition of 1/50 of mercury.

December 9, 1916. Another injection was given, at this time adding 1/40 of a grain of mercury.

December 23, 1916. Another injection was made. This time we were able to withdraw thirty cubic centimeters of fluid, and reinjected ten cubic centimeters with the addition of 1/30 of a grain of mercury.

December 28, 1916. Vision down to 20/200.

January 4, 1917. Another injection with the addition of 1/25 grain of mercury.

January 5, 1917. Patient complains of headache.

January 11, 1917. Complains of burning sensation in eyes. Pupils widely dilated. Boric acid wash controlled burning sensation.

January 19, 1917. Intraventricular injection with the addition of 1/20 grain of mercury.

February 3, 1917. Complaints from other patients in ward that patient has been irrational and evidenced desire to open windows at night. But apparently quite rational in my presence.

February 4, 1917. Removed by his family.

The next I heard of him was that he had been confined in the State Hospital for the Insane.

In reply to a letter from me, requesting a report upon the condition of the patient, which Dr. R. F. Dowell, assistant physician, was good enough to send me, he reported the following:

Entered March 1, 1917, and diagnosed by the staff as a case of general paralysis of the insane. The serologic findings were positive, both on the blood and the spinal fluid, and the physical and mental picture was typical. Mentally he shows gross defects in memory and judgment. Pupils unequal—right larger than left; do not react to light or accommodation; can recognize fingers at two feet; perimetric and fundus examinations were not made. No apparent areas of anesthesia or hyperesthesia. Fine tremors of tongue and outstretched hands are noted, and all deep reflexes are exaggerated. There is no ankle clonus or Babinski, and no Oppenheim. For past two weeks he has shown rapid physical and mental decline.

June 4, 1917. Was placed in bed.

June 15, 1917. Developed partial paralysis of the muscles of deglutition, and since then has been unable to take solid nourishment. There has developed a retention of urine, and catheterization had to be resorted to.

June 20, 1917. Removed from hospital by family.

June 21, 1917. Died.

The end was typical of a general paretic.

The writer was unfortunately away from the city and a postmortem examination of the brain could not be had.

The lethal issue of this case, in my opinion, justifies no definite conclusion as to the merits of direct intraventricular antiluetic medication. Certainly, the observations made after the first and subsequent injections do not tend to prove that this method of treatment is valueless, or without promise of hope for this disase.

It must be taken into consideration that the patient came under our observation at a time when the luetic infection had made such deep inroads on the central nervous system that all physical findings left no doubt as to the diagnosis of general paresis. The hopelessness of his general condition is certified by the utter failure of the customary constitutional treatment.

When finally it was decided to endeavor to reach the optic nerves through the skull, his condition had reached a stage where a cure must be looked upon as almost miraculous. As ophthalmologists we are not primarily interested in the general neuropathologic condition, and it is encouraging to note that in spite of the heroic measures instituted, not only was no harm produced, as is evidenced by several reports from the attending physician of the institution of the insane to which patient was confined, but that, if anything, the usual progressive process of optic atrophy was for a time at least arrested, so that limited vision was present practically to the very instant of death, where otherwise total blindness in all probability would have been the result without this method of treatment.

I feel safe, therefore, in expressing the view that under more favorable circumstances topical treatment, especially under modified methods, such as I learned personally Dr. Schoenberg has under consideration, better results may be anticipated. This view is also justified from preliminary observation, as yet incomplete, on several patients still under observation.

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

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The Influence of Vascular Disease in the Retina on the Prognosis as Regards Life.

ADAMS, P. H. (*British Journal of Ophthalmology,* March, 1917), has collected one hundred and fifty-nine cases of retinal lesions from the records of the Oxford Eye Hospital and his private records, and has traced the subsequent history of one hundred and twenty-four of them, with the view of examining more accurately the prognostic influence on life.

The types of retinal lesions selected were flame shaped hemorrhage and signs of vascular disease in the retina, venous thrombosis and hemorrhagic retinitis, "embolism" of the central artery, retinitis circinata; in fact, all those conditions usually associated with the condition of arteriosclerosis. True albuminuric retinitis is omitted.

The cases are tabulated in groups according to their ages. The conclusions arrived at from the study of statistics are given as follows: Retinal lesions are considerably more common in women than men, and that not altogether due to child bearing, as thirty-eight of the ninety-six women were, as far as he could discover, unmarried. The cases were most numerous between the ages of sixty and seventy, and next between fifty and sixty.

Th older the patient, the better the prognosis as regards life, irrespective of the presence of albumin in the urine to a large extent; whilst the younger the patient the worse the prognosis, especially so if albumin is present in the urine.

W. R. P.

On the Rule for the Correction of Astigmatism.

NORDENSON, J. W. (*British Journal of Ophthalmology,* March, 1917), reviews the rules for and against the correction of astigmatism.

In general, correction of astigmatism is indicated only when it increases visual acuity. It is then advisable on account of the following:

1. The need of accurate detail vision.
2. Asthenopia. (a) Accommodation asthenopia. (b) Eyelid asthenopia.
3. Dangers to the eye involved by astigmatism. (a) Development of strabismus. (b) Development of myopia.

Contraindications to the correction of astigmatism are given as follows:

1. The inconvenience of wearing glasses where one eye is normal and the other astigmatic.
2. Nonimprovement of visual acuity by correction. The exception to this is where visual acuity improves after wearing correcting glasses for a period of time.
3. Intolerance of correction, which is accounted for on the supposition that the eyes have been accustomed for so long to the astigmatic state as to make the abnormal, in a certain sense, the normal condition, and that the cerebral center for vision resents an interference with the established order of things.

4. Lagrange's theory of self-cure of astigmatism in children, if correcting glasses are not given, is discussed by the writer, and discredited as untenable in the light of our modern conception of the mechanism of accommodation.

W. R. P.

Quinin Amaurosis, With Report of a Case.

BALLANTYNE, A. J. (*British Journal of Ophthalmology*, March, 1917), reports a case of quinin amaurosis which differs somewhat from the cases so far described.

The typical case is described as follows: Within a few hours following the taking of an excess of quinin sulphat there is tinnitus, deafness, and bilateral blindness. Occasionally there is collapse, delirium, convulsions, or loss of consciousness. Very soon the cerebral symptoms pass off, then the hearing returns, and the patient is left with a visual disturbance very often amounting to total blindness, and with widely dilated and unresponsive pupils. In almost all cases, when the first ophthalmoscopic examination is made, the discs are found to be pale and all the vessels contracted, the arteries often reduced to almost invisible threads. Sometimes the central part of the fundus has a pale cloudy aspect, with a cherry red spot representing the fovea. After an interval, varying from a few hours up to several weeks, light perception and the pupil reactions begin to return. At first the light perception is only transient, and this feature characterizes also the form vision, the return of which soon follows. The recovery of function is at first purely central. In course of time the field of vision expands, but although central vision in many if not most cases becomes normal in a few weeks, there remains a permanent concentric contraction of the field. There is also found to be a degree of night-blindness, which, added to the contraction of the field, hampers the patient in spite of the excellent visual acuity. Of the retinal changes, the retinal opacity and foveal spot disappear, and the vessels may regain their caliber to some extent, but narrowness of the vessels and a pronounced pallor of the discs are permanent.

The case reported differs from the great majority of those hitherto published in that, although the patient was first seen four days after the administration of the quinin, a further period of five days elapsed before the characteristic ischemia of the disc and retinal vessels made its appearance.

The patient, a girl of twenty-two years, following a large dose of quinin, within a few hours developed marked tinnitus, deafness, and blindness. Four days later the mental condition was clear, the hearing normal, and no tinnitus. Both pupils were widely dilated and quite inactive. Blindness was absolute. The fundi were practically normal. There was perhaps a little haziness of the nasal border of each disc, and some streakiness of the retina along the course of the vessels leaving the temporal side of the disc. Ophthalmoscopic examination was repeated every day, and on the ninth day after the quinin ingestion, the discs were found to be pale and all the vessels abnormally pale and narrow. There was still no vision and very slight light reaction. Next day vision began to return, with steady improvement from day to day, with gradual expansion of the field. But at the same time an increasing pallor of the discs and narrowing of the vessels was present. The final visual result was 4/9 each eye and No. 1 Jaeger. The right pupil is slightly smaller than the left. The reactions are now fairly active. The field of vision shows marked concentric contraction, its maximum extent being forty degrees from the fixation point in the temporal direction. Central color vision is normal. She experiences considerable difficulty in finding her away about in the dark. The discs are very pale, like ivory, with a delicate suggestion of a pink color. Both arteries and veins are narrower than normally, the arteries, especially where they cross the discs, being pale in color.

The following conclusions are stated:

1. That in quinin poisoning complete loss of vision may be found in association with a normal condition of the fundus oculi, and that there may be a striking recovery of vision in spite of the presence of well-marked fundus changes.

2. That in all, or nearly all, cases of quinin amaurosis, ophthalmoscopic changes, such as congestion of optic nerve and retina, pallor of the disc, narrowness of the retinal vessels, and cloudy opacity of the retina, make their appearance sooner or later, but that there is no correspondence between the character or severity of these changes and the intensity of the visual defect.

3. That the visual defect cannot, therefore, be due to such changes, but rather to a condition of the retinal elements invisible with the ophthalmoscope.

4. That this change may be induced or aggravated, in the first place, by ischemia due to contraction of the vessels of the optic nerve and retina, but that it is in the main the result of a direct toxic action of quinin upon the retina itself, and that the ultimate recovery of central vision, with loss of peripheral vision, and failure of vision in twilight, suggests a selective action of the poison upon the rods. W. R. P.

A Case of Metal Embedded in the Lens—Normal Vision Regained After Nine Months.

Buchanan, Leslie (*British Journal of Ophthalmology*, April, 1917), reports a case of a brass worker, aged twenty years, in whom a piece of metal had perforated the eye, lodging in the lens. Examination showed a metal chip measuring one meter in each direction lying just behind the center of the lens. The lens was slightly opaque, due to the presence in it of small faint clouds, without any formation of radial lines of opacity. Vision, 6/60. The metal was allowed to remain undisturbed in the lens, under weekly observation. The opacity was seen to slowly clear until nine months later no cloud was seen in the lens at all, the metal still visible, sharply defined and bright. Vision, 6/6.

There are several interesting features in this case. The metal must have been quite aseptic to allow of its passage through the cornea and iris without giving rise to any infection. It was probably very hot at the moment it entered the eye, which would account for asepsis.

The wound of the lens capsule seems to have been plugged by a small portion of iris which was carried in by the metal and left in the little opening. This would explain why the lens did not become entirely opaque.

The cloudy opacities in the lens cleared away entirely, leaving the metal as distinct as if it were lying in water. Probably the youth conduced to this satisfactory result.

The metal has not rusted, so far as can be detected, in the very least, which may be due to the fact that it was soft iron, not steel. The absence of rusting should conduce to the preservation of vision, and it is probable that a much better result will be attained than if extraction had been attempted. It is quite possible that opacity may develop when the influence of age begins to tell on the lens, but, at all events, several years of useful vision may be hoped for before this takes place.

W. R. P.

The Retinal Signs of Arteriosclerosis Compared With Those Due Simply to Increased Blood Pressure.

BORDSLEY, P. C. (*British Journal of Ophthalmology*, April, 1917), has attempted to differentiate the ophthalmoscopic findings of increased blood pressure from those of arteriosclerosis. He became convinced that the cardinal signs of sclerosis of the retinal vessels, namely, tortuosity, variation of caliber, alteration of light streak, and indentation of veins, did not necessarily indicate arterial sclerosis, but were often due to some accessory cause.

The following distinguishing characteristics were observed:

In simple high tension:

1. The vessels have an appearance of uniform distension and fullness.
2. The light streak is broadened out; it may be greatly increased, apparently reaching almost the whole breadth of the vessel.
3. The light streak is very much brighter than normal, the brilliancy increasing with the increase of the tension, until with very high tension it becomes like bright copper wire (not silver wire).
4. The tight arteries indent the veins; with medium high tension they indent them slightly, with very high tension they indent them deeply, leading to back pressure and all its consequences.

The following signs indicate sclerosis:

1. Irregular tortuosity, especially of the smaller twigs.
2. Increased brilliancy of the light streak, while at the same time the light streak appears narrower and more central.
3. Irregularity of caliber and beading are sure indications of sclerosis.
4. General diminution in the size of the vessels and "silver wire" reflex show advanced sclerosis.

The two conditions of high tension and sclerosis very frequently, of course, coincide, but not by any means always.

A number of healthy patients were carefully examined as to their retinal vessels and blood pressure, and exact notes made. A hypodermic injection of five to eight minims of adrenalin chlorid was then injected, and the blood pressure was recorded at intervals until it was found that there was no further rise. This was roughly one to one and one-half hours after injection. Some cases responded well, the blood pressure rising to forty to forty-five millimeters; others to a lesser extent, with a rise of twenty to thirty millimeters; and in some there was no rise of blood pressure after the injection of adrenalin chlorid.

When the pressure was considerably raised, then another careful observation of the retinal vessels was made and a description of them accurately noted down.

From this artificial raising of the blood pressure the following observations of the retina were made:

1. Increased fullness of the arteries.
2. Increased brilliancy of the light streak.
3. Increased breadth of the light streak.
4. (a) Indentation of veins, where previously not indented. (b) Increased indentation of veins (in a few cases, very much increased, where previous slight indentation existed).
5. The reduction of all these signs on the return of the blood pressure to its former level.

The writer believes that the blood pressure may be estimated by observation of the retinal vessels alone. When there are no definite signs of sclerosis, he thinks:

(a) Very slight indentation of veins, full arteries with broad light streak, indicate one hundred and forty-five to one hundred and fifty millimeters.

(b) Very brilliant broad light streak with deeper indentation and slight signs of obstruction indicate one hundred and fifty to one hundred and sixty millimeters.

(c) Very brilliant broad light streak with apparent obliteration of veins indicate one hundred and sixty to one hundred and eighty millimeters.

The sources of error are given as faulty examination, especially when high refractive errors are present, acute toxemia, and failing heart action. W. R. P.

Bitemporal Hemianopia—The Later Stages and the Special Features of the Scotoma.

TRAQUAIR, H. M. (*British Journal of Ophthalmology*, April and May, 1917), gives the results of his investigation on bitemporal hemianopia, as studied from the cases in the literature and twenty-two cases of his own material. There is a general agreement as to the main features of the fields, namely, that the defect in the peripheral field nearly always occurs from above down in the temporal field, from below up in the nasal field, and progresses round the fixation point clockwise in the right field, and counter-clockwise in the left. The scotoma develops in the same way in this respect. There is still scope for investigation, however, in regard to certain details, such as: 1. The earliest stages. 2. The later stages. 3. The characteristic features of the scotoma; and 4, The mode of production of the field changes and their relation to the etiology of the condition.

The chief object of the paper is to discuss the later stages of bitemporal hemianopia and the nature of the frequently associated scotoma.

In the very early stages, when alterations in the periphery of the field are undemonstrable, distinct changes may be found towards the center within the thirty degree circle. The visual function over practically the whole of the upper outer quadrant may be depressed to some extent, and the earliest changes found in the supracecal region.

By later stages are meant the stages of advancing blindness in the nasal field. Some writers have found that the upper and some of the lower nasal quadrant remains lost, but the literature shows few, if any, observations directed specially towards this point. Taken as a whole, the literature provides some fifty-nine cases in advanced stages in which sufficient details of the condition of the fields are given. Thirty-five show no definite indication as to whether the upper or the lower nasal quadrant is retained. Of the remaining twenty-five cases, seventeen showed definite retention of the upper inner quadrants, and only eight retention of the corresponding lower quadrant. A striking feature, also, is the fact that the margins of the retained portion, when this occurs above, frequently lie along the vertical and horizontal meridians of the field, enclosing a definitely quadrant shaped area, while the remnant in the lower nasal quadrant usually consists of a mere irregular patch. The conclusion would appear to be that termination, or at least the attainment of the permanent stages, is about twice as common in the upper nasal quadrants as in the lower.

With regard to the scotomas so frequently present in bitemporal hemianopia, several writers, notably de Schweinitz and Holloway, have noted the paracentral or centrocecal position, the quadrantic or hemianopic shape, the variation in size or intensity and the enlargement in the temporal field. Rinne showed the characteristic progression of what may be called the chiasmal scotoma round the fixation point.

The method of examination is described by the writer as "the quantitative method of perimetry." Its essential feature is the use of a series of graduated test objects, varying from 1.0 millimeter or even 0.5 millimeter up to 60 millimeters or 70 millimeters in diameter, at distances of from 250 millimeters to 2,000 millimeters or more.

The most useful test objects are five millimeters and one millimeter with the ordinary perimeter, and two millimeters and one millimeter with Bjerrum's screen. Objects larger than forty millimeters are rarely required.

Clinical material now brought forward included twenty-two cases of bitemporal hemianopia, and two of similar but less definite nature. The upper outer quadrant of the field is referred to as the first quadrant, the lower outer as the second, the lower inner as the third, and the upper inner as the fourth quadrant.

The cases are divided into the following groups:

Group 1.—Ten cases in the later stages.

Group 2.—Six cases (five with scotomata) in relatively early stages, but with no features definitely bringing them into line with group 1.

Group 3.—Six cases with only early changes.

Group 4.—Two cases allied to, although not definitely, bitemporal hemianopia.

Group 1.—Ten cases in the later stages showing complete, or nearly complete, loss of the temporal field of one or both eyes to a medium sized test object. Eight of these showed retention of the fourth quadrant; in one this sign was not looked for, and in one it could not be elicited. This is the only advanced case in which differentiation of the nasal quadrants was looked for and not found in one field at least.

Group 2.—These six cases, although showing relatively early stages in the peripheral fields, had characteristic typical features; in five, in association with scotomata; in the sixth, in the color fields. They all showed relative retention of the fourth quadrant.

Group 3.—The field changes were all early.

Group 4.—Two other cases, with field changes, evidently closely allied to if not actually bitemporal hemianopia, showed similar features.

The sixteen cases of Groups 1 and 2, which showed well developed defects, either central or peripheral, or both, in fourteen showed the typical clockwise and counter-clockwise progress of the defect in the right and left fields, respectively, with relative retention of the superior nasal quadrant.

In the central part of the field two types of defect occur, either separately or together. The nonscotomatous type consists usually in an upper outer or outer flattening or indentation of the central isopers. It is demonstrated by reducing the size of the test object, colored if necessary, until the resulting field extends only a few degrees from the fixation point. It is then frequently found that only the fourth quadrant remains. This type differs from the scotomatous type, in that the defective area is not surrounded by an area of relatively stronger function.

The second type of central defect is the scotoma. It behaves like a small field within the field, being most dense in the first quadrant, where it makes its appearance, and becoming progressively less dense in the second, third and fourth quadrants.

In the twenty-two cases of bitemporal hemianopia, scotomata were demonstrated in ten cases, five of which showed typical characteristics. Of the remaining five, two were a typical and three incapable of analysis.

Relative retention of function in the fourth quadrants may be regarded as the typical penultimate stage in the normal progress of bitemporal hemianopia.

The anatomic relations of the chiasma to the adjacent structure is then discussed. Exception is taken to the statements in the textbooks that the chiasma lies in the optic groove. It lies well behind and above the usually described position. Its posterior edge projects behind the level of the dorsum sellæ to an average of 1.58 millimeters, and is very rarely found in front of this point. A large subarachnoid space lies beneath the chiasma, and the vertical distance between its lower surface and the diaphragma sellæ is as much as five millimeters to ten millimeters, according to different observers.

The writers mentioned pay scant attention to the position of the infundibulum. This structure, as is well known, resembles a much elongated funnel, being thin at its termination and considerably thicker where it leaves the third ventricle. At this point it lies behind the level of the dorsum sellæ, over which it passes in a forward and downward direction. Immediately beyond its commencement it is in contact with the center of the lower and posterior surface of the chiasma. As it arches over the dorsum sellæ, its direction is almost parallel to the plane of the chisma. In front of the dorsum sellæ it is directed more downwards, leaving the chiasma at a very acute angle, and passes to the posterior edge of the foramen diaphragmatis, keeping close to the dura covering the dorsum sellæ.

It is important to remember that it is the infundibulum and not the hypophysis which is in immediate contact with the chiasma. Thus, a commencing primarily infundibular tumor, or a thickened and congested infundibulum pressed upwards by a subjacent hypophyseal enlargement, would impinge directly upon the midline of the under surface of the chiasma, and might exert an approximately central longitudinal pressure at a comparatively early stage.

As to the mechanism and production of the field defects, three theories have been advanced, depending on pressure, traction and local intoxication, respectively. The objections to the mechanical pressure theory are summarized as follows:

(a) The great deformation which the chiasma and its connections may undergo without the production of much perimetric change.

(b) The frequent difficulty of connecting the anatomic relationship of the tumor to the chiasma with the field changes present.

(c) The existence of a standard type of field change common to bitemporal hemianopias arising from a large variety of causes.

(d) The preponderance in some cases of central over peripheral defects.

The traction theory is based upon the fact that a large tumor growing between the tracts and below the chiasma might so stretch the nerve fibers as to cause functional interference. The main objection is that traction can only result from a large tumor, whereas the field changes commence in their typical form from the beginning. In connection with both pressure and traction, it is evident, from the anatomic relations of the parts, that before either, and especially the latter, can take effect, enlargement of the hypophysis must already project some distance above the normal level of the diaphragma sellæ; according to Hirsch, at least 7.5 millimeters, and according to Cope, 10 millimeters or more. There is no evidence to show that the earliest field changes are delayed until such dimensions have been attained by the tumor. (To be concluded.) W. R. P.

Three Cases of Fur Infection of the Conjunctiva From Cats.

Lawson, Arnold (*The British Journal of Ophthalmology*, May, 1917), reports three cases of infection of the conjunctiva from cats, all occurring in children of the prosperous classes, whose homes were of the cleanest and best.

The first case occurred in a little girl, following a romp with a pet Persian cat. Acute conjunctivitis followed, both eyes streaming with yellow purulent discharge and marked chemosis of the lids. Cultures from the discharge and also from the cat's fur showed staphylococcus pyogenes albus.

The second case occurred in a boy of fourteen years, who was very fond of a Persian cat, which he cuddled frequently. The left eye became inflamed, accompanied by discharge and swelling of the left parotid, which gradually increased in size until the whole left side of the face was much swollen, extending into the neck continuous with another indurated mass of swollen glands. The conjunctival surfaces of both tarsi became covered with coarse granulations, especially marked in the upper lid. Recovery followed after six weeks of thorough treatment. Streptococcus was found in both the lid scrapings and the cat's skin.

The third case occurred in a little girl of five years, who was in the habit of fondling a cat which frequented the neighboring sheds. A conjunctivitis resistant to ordinary treatment developed, accompanied by enlargement of the submaxillary and sternomastoid glands. The case drifted for several months with steady increase in the neck condition. Eversion of the upper lid revealed a mass of exuberant cock's comb granulations occupying the greater part of the tarsal tissue. The clinical picture as well as the pathologic findings indicated conjunctival tubercle. Scraping of the lid and excision of the glands resulted in recovery. The great probability was that the child was infected with the bovine type of tuberculosis, and the fact that the cat was a farmyard cat, and continuously hugged and cuddled by the child, renders a fair assumption that the cat was the means by which the infection was carried. The writer's conclusion is that the cat, as a pet, is a source of danger chiefly to children. W. R. P.

The Retinitis of Arteriosclerosis and Its Relation to Renal Retinitis and to Cerebral Vascular Disease.

Moore, Foster (*Quarterly Journal of Medicine*, Vol. 10, Nos. 37 and 38, October, 1916, January, 1917). The investigations were carried out with three objects in view:

1. To define, as accurately as possible, those changes in the retina and its vessels which are indicative of arteriosclerosis: to apportion to these changes their relative importance; and to follow their development and course over considerable periods of time.
2. To establish that a condition of retinitis may be engrafted on retinal arteriosclerosis; that this retinitis has distinctive characters; and that in its course and prognostic significance it differs markedly from renal retinitis, and calls for separate recognition.
3. To consider in detail the extent to which disease of the retinal vessels is an indication of similar disease of the cerebral vessels.

The patients upon the examination of whom the bulk of this work has been carried out consisted of sixty-six seen at Moorfields, and forty-four seen at St. Bartholomew's. Thus one group represents those who present themselves at an ophthalmic clinic—i. e., the vascular disease has especially involved the retina—and the other those who have been admitted to a general hospital suffering from the results of cerebral vascular disease.

The writer confirms the accuracy of Gunn's work in the definition of the characteristics of the retinal vessels indicative of retinal arteriosclerosis, considering only those particulars in which his observations tend to amplify or modify those of Gunn. The headings and the order of headings used by Gunn are followed:

1. Irregularity of lumen of the retinal arteries.
2. Tortuosity of the arteries.
3. An exceptionally narrow and bright central light streak which may show a series of brighter points at intervals.

These changes are of chief importance when they involve the tertiary and secondary branches of the retinal artery.

4. Loss of translucency of the arterial walls.
5. Obstruction of the bloodflow in the veins where they are crossed by arteries.
6. Edema of the retina.

1. Irregularity of lumen of the arteries. A high degree of arteriosclerosis may occur without any irregularity of the arterial lumina being present; when, however, this irregularity is present, it is an indication of severe disease and a high or very high blood pressure. The narrowing of the artery develops somewhat gradually as the vessel is traced along, until the lumen may be reduced to one-half or less of its original diameter; it then dilates again to its former size; and this process may be repeated several times in the same vessel as it is traced towards the periphery.

It seems probable, as suggested by Coats, that more or less localized areas of endothelial proliferation are responsible for the appearances. He has pointed out that subendothelial proliferation is the common disease of the central retinal arteries, whereas in its branches in the retina, mesarteritis is more common.

2. Tortuosity of the arteries is seldom extreme in degree and is one of the less valuable of the signs of arteriosclerosis, and especially so since variations in tortuosity are so wide under physiologic conditions.

3. The central light reflex is one of the most important signs of arteriosclerosis and of universal occurrence in this disease. It consists of unusual brightness of the central light streak and of the artery as a whole, and, in cases which are severe, the central streak, besides being bright, is slightly irregular, with brighter dots at short intervals. This appearance is due to fibrosis of the middle coat of the vessel.

4. Loss of translucency of the arterial wall is determined by the degree of visibility of a vein crossed by a sclerotic artery.

5. The phenomena to be seen at arteriovenous crossings are never seen apart from arteriosclerosis, are always present to some extent, and form a reliable means of judging the sclerosis because so easily made out. The phenomena are considered under two heads:

(a) Obstruction to the flow in the veins, with distension of the vessel peripheral to the crossing, but any considerable or very obvious degree of banking is but rarely seen.

(b) Displacement of the line of the vein. In the earliest stage of sclerosis of the artery the line of the vein will remain unaltered, but the vessel will be hidden under the artery and for a narrow margin on each side of the arterial wall. As the thickening of the arterial wall develops, the line of the vein comes to be diverted, and the more marked the sclerosis the greater is the displacement of the line of the vein.

Other changes considered are edema of the retina, which the writer does not believe to be a sign of arteriosclerosis, and general reduction in the size of the vessels, which may go on to conversion into fibrous threads.

Retinal hemorrhages, while exceedingly common with retinal arteriosclerosis, are looked upon by the writer as merely an incident in this disease, although in some cases an increase in their number occurs coincidently with the onset of other serious symptoms. The occurrence of hemorrhages is believed immediately due to an impairment in nutrition of the vessel wall and to changes in the blood. All types of hemorrhage are much the most common over the central region of the retina. In general they tend to become absorbed in time, the period varying with their size and density, and usually leave no trace behind.

Arterial disease as a cause of optic atrophy is discussed. Curtailment of the blood supply to the retina, with impairment of sight and partial or complete atrophy of the optic nerve, may be brought about in two ways as a result of arteriosclerosis. Thus (1) thrombosis of a diseased artery may occur with sudden and irremediable loss of sight and subsequent optic atrophy; or (2) the sclerosis of the arteries may gradually attain such a degree that they are no longer able to transmit sufficient blood for the needs of the tissues. In this latter case there is a gradual deterioration of vision, with irregular contraction of the visual fields, and a varying degree of atrophy of the optic nerve.

As regards sex incidence in severe retinal arteriosclerosis, it is seen more often in the female sex. In sixty patients of the present series, thirty-six were females and thirty males. The average systolic blood pressure for the females was 220 millimeters and for the males 210 millimeters. It seems that women are more tolerant of a high blood pressure than men.

The second portion of the paper deals with arteriosclerotic retinitis as a clinical entity. A group of cases is tabulated in which a condition of retinal exudate has become engrafted on retinal arteriosclerosis. The writer attempts to show that this condition differs in a number of important particulars from renal retinitis, and is sufficiently distinctive to warrant separate recognition under the term "arteriosclerotic retinitis."

It is in a large measure distinct from renal retinitis in its ophthalmoscopic characters, in its significance, and in its prognostic value.

1. It is always associated with severe general arteriosclerosis and retinal vascular disease.

2. Its gradual evolution from a condition of retinal arteriosclerosis can be traced.

3. The ophthalmoscopic differences are distinctive.

(a) The sclerosis of the retinal arteries is always a precursor to the development of the exudates, and consequently evidence of this is always well marked. In renal retinitis, vascular disease is usually present; it is, however, less marked, and the evidences of it are apt to be masked by the other manifestations of retinitis.

(b) Retinal hemorrhages tend to be smaller and more scattered than in renal retinitis.

(c) Patches of soft edged exudate (woolly patches, etc., cottonwood patches, snow bank or cumulus cloud exudate) are rare in arteriosclerotic retinitis, and when they occur are probably evidence of beginning renal insufficiency.

(d) General retinal edema does not occur, and consequently retinal detachment is rarely, if ever, produced.

(e) The star figure may be present in either case.

The distinctive features concern the appearance of the exudate which composes the star figure.

In arteriosclerotic retinitis it is composed of the small dots already described. In renal retinitis the dots are larger and more elongated in the line of the ray of the star; they are less discrete from the first, and tend to coalesce to form ragged and irregular rods. Ophthalmoscopic evidence of edema is usually present, and as the disease progresses the star arrangement is often obscured as a result of coalescence and conglomeration of the exudate.

(f) In forty-five per cent of the thirty-one patients in this series the retinitis was unilateral. Renal retinitis may be evident in one eye before the other, but it seldom remains unilateral for more than a few days or weeks.

4. The tenure of life of the subjects of this condition is very uncertain, but they often live a number of years.

5. The cause of death is referable to disease of the vascular system, and not to disease of the kidney.

The relation of sclerosis of the retinal arteries to cerebral arteriosclerosis is also studied from the observation of the cases in the series. The evidence as to the relation of the two conditions was both striking and conclusive.

1. Of forty-four patients suffering from a gross cerebral vascular lesion thirty-one (seventy per cent) exhibited evidence of retinal vascular disease, and in nineteen of them (forty-three per cent) is was severe in degree.

2. Of twenty-six deaths in which the cause was ascertained, a gross vascular cerebral lesion was the cause in twelve (forty-six per cent).

3. Of the sixty-six patients in whom retinal vascular disease was sufficiently severe to give rise to symptoms, there were forty-six in whom there was satisfactory information of gross cerebral lesions. W. R. P.

The Preparation of the Patient for Operation.

Lancaster, Walter B. (*Journal American Medical Association,* July 22, 1916). This article applies more particularly to operation on the eye. The author dwells upon the importance of a careful general examination, and also an examination of the nose and throat. Arteriosclerosis is also an important question, because it is often a factor in intraocular hemorrhage. The skin and lacrimal sac require careful attention. The treatment of the conjunctiva is summarized in detail. The author believes in a careful study of the bacterial contents of the cul-de-sac, and considers the fact that the laboratory report is not fully to be trusted. A great deal of stress must necessarily be laid upon the clinical appearance of the conjunctiva. E. S. T.

Strabismus Produced by Operations for Strabismus.

Todd, Frank C. (*Journal American Medical Association,* July 22, 1916). The author classifies his cases under four heads: First, cases in which the operation has failed to fully correct. Second, cases in which overcorrection has occurred. Third, cases in which strabismus of a different plane has resulted. Fourth, exophthalmos and enophthalmos. Under Case 1 the author remarks: "While it is never best to sever a tendon completely, it is necessary to cut all of the tendon fibers in one place or another in order to secure any relaxation." Cicatricial contraction may be prevented or minimized by making a conjunctival incision parallel to and at one edge of the tendon, so that the cut edges of the conjunctiva may not come in contact with the cut tendon. A number of illustrative cases are cited. E. S. T.

A New Shortening Technic, With Report of Forty-two Operations.

O'CONNOR, RODERIC (*Journal American Medical Association*, July 22, 1916), begins by exposing the tendon of the muscle completely; then by separating the fibers and passing a suture around each bunch of fibers. He obtains the effect by straightening the suture and so shortening the muscle. It is impossible to describe this method without illustrative cuts, and those who are interested are referred to the original article. The cases are reported in detail. E. S. T.

Discission of Crystalline Lens.

JACKSON, EDWARD (*Journal American Medical Association*, July 29, 1916). Six cases are reported with clinical comments, and the author concludes as follows: "For monolateral cataract up to middle life, discission is to be considered as a proper procedure; and in many cases the patient will prefer it to extraction. The first discission should make only a short opening in the capsule; but may well penetrate to the center of the nucleus, so that disintegration of the nucleus may begin as soon as possible. The amount of swelling from a given interference will be proportioned to the size of the opening in the capsule, and the absence of previous change in the lens substance. Severe reactions and surgical shock are provoked by the presence of large masses of lens substance in the anterior chamber. Possible hemorrhage, from making the puncture through the vascular limbus, causes no danger to offset the greater safety from infection secured by this point of entrance." E. S. T.

Preliminary Capsulotomy in Immature Cataract.

BRUNER, WILLIAM EVANS (*Journal American Medical Association*, July 29, 1916). The author has operated according to the method of Dr. Homer Smith. Six cases are reported with good results. E. S. T.

Retinal Detachment in Hydrophthalmia.

KNAPP, ARNOLD (*Journal American Medical Association*, July 29, 1916). The author remarks that it is unusual to find cases of hydrophthalmia in middle life, and considers that a number of these cases are lost through infection, etc. A case is reported in a child aged eleven, in which a detachment of the retina could be seen. The eye became soft and gradually shrunk. The author concludes as follows: "It seems to me reasonable to assume, therefore, that in cases of hydrophthalmia the vitreous degenerates in the advanced stages of the glaucomatous process, and at a certain point or stage of degeneration conditions are present, sufficient to overcome the natural tendency of a glaucomatous eye against detachment, which produce a change from increased to decreased tension and a detachment of the retina. The possibility of a spontaneous detachment of the retina should be considered before deciding to operate on advanced cases of hydropthalmia.

E. S. T.

Thyroid Extract in the Treatment of Malignant Uveitis.

BORDLEY, JAMES, JR. (*Journal American Medical Association*, August 5, 1916). This paper is supplementary to a former paper read before the American Ophthalmological Society. Two cases are reported—one a woman aged twenty-seven, the other a woman aged twenty-five. Both were given iodothyrin. The first in doses of two and one-half grains three times a day; the second, the same quantity, increasing to seven and one-half grains. Each made a good recovery. E. S. T.

Effects of Heat on the Eye.

SHAHAN, WILLIAM E. (*Journal American Medical Association*, August 5, 1916). This paper gives the results of an experimental investigation with a thermophor. The following preliminaries must be satisfied: "1. The devising of some simple, convenient means of applying constant, measured quantities of heat directly to the corneal or scleral surfaces for measured lengths of time. 2. The determining by experiment on animals of the physiologic limit of heat tolerance for stated lengths of time. The physiologic limit of heat tolerance will be defined as the maximum temperature at which tissues may be held for stated lengths of time without permanently harmful effects. 3. The application of physiologic limits to various pathologic conditions (infections, etc.), and tabulation of results." The following experimental results were obtained with dog's or pig's eyes: "1. Corneal epithelium began to cloud faintly at 122° F. and became unmistakably clouded after remaining at that temperature for one minute. At 123° F. there was slight opalescence of corneal substance, at 130° F. dense opalescence. At 138° F. the epithelium was white, and at 140° F. the corneal substance was shrinking and the epithelium shriveled. 2. The lens began clouding slightly at 135° F.; began to get opalescent at 142° F.; became opal white at 157° F., and pearl white above that, and became of a firm rubberlike consistency. 3. Vitreous remained perfectly unchanged until the temperature approached 212° F., when the whole gelatinous mass became perfectly fluid, and remained so on cooling, even to low temperatures (approaching 32° F.). These experiments would suggest beginning on living eyes with a temperature of about 120° F. and varying that according to findings." Some experimental work was also done with pneumococcus ulcers. The results seem to show that any temperature up to 130° F., applied directly to the ulcer for ten minutes, appears to have no beneficial effect whatever.

E. S. T.

Complete Vocational Disability From Muscular Imbalance of the Eyes.

MILLS, LLOYD (*Journal American Medical Association,* September 2, 1916). This paper is a résumé in general terms of the principal causes of eye strain and their management.

E. S. T.

The Relation of Choked Disc to the Tension of the Eyeball—An Experimental Study.

PARKER, WALTER R. (*Journal American Medical Association,* October 7, 1916). The author has carried out a series of experiments on dogs and monkeys to prove, if possible, the relation between choked disc and the tension of the eyeball in the case of artificially increased intracranial pressure. Various theories of the causation of choked disc are cited. The details of the experiments are as follows: "The refraction of each eye was determined with the ophthalmoscope, and the tension taken with a Schiötz tonometer. The intraocular tension of one eye was reduced by the trephining operation. After recovery from the effects of the operation, a second ophthalmoscopic examination was made and again the tension recorded. Artificial intracranial pressure was induced (1) by the use of direct digital pressure; (2) by the injection of normal salt solution under registered pressure; (3) by the distention under registered pressure of an air bag introduced between the skull and dura; (4) by the injection of paraffin through a brass cannula screwed into the skull and perforated with an opening made to fit the tip of the paraffin syringe; (5) by the introduction of sea tangle tents between the bone and dura, and (6) by the introduction of sponge tents between the skull and dura." The conclusions are as follows: "1. Choked disc can be produced in the dog and monkey by artificially increasing the intracranial pressure. The most satisfactory results are obtained by the use of sponge tents. 2. When the intracranial pressure is increased by artificial tumors placed in the occipitoparietal region, one element in determining which disc will be affected first is the tension of the eyeball. 3. When the intracranial pressure is increased by artificial tumors placed in the occipitoparietal region, the nerve in the eye of least tension is the first to show the choked disc. 4. When the intracranial pressure is increased by artificial tumors placed in the occipitoparietal region, there is no direct relation between the location of the tumors and the eye first affected." E. S. T.

A Further Note on the Diagnostic Value of Retrobulbar Neuritis in Expanding Lesions of the Frontal Lobes, With a Report of This Syndrome in a Case of Aneurism of the Right Internal Carotid Artery.

KENNEDY, FOSTER (*Journal American Medical Association*, November 4, 1916). The patient was a woman of fifty-three years. In September, 1915, the vision of the right eye began to fail and grew steadily worse. A definite central scotoma formed, and finally at the end of two months the patient was able only to see moving objects in the periphery in the left visual field. The right optic nerve showed distinct pallor in its outer part. The patient remained well except for an occasional slight headache. A decompression operation was finally done, and a mass of pinkish-gray gelatinous tissue was seen, which was thought to be the outer part of a glioma. No attempt at removal was made. Two and a half months after the operation, the vision having become slightly reduced in the left eye, it was discovered that complete anosmia had occurred, which gave rise to the belief that the tumor had increased very considerably. A week later the patient fainted one morning; there was a slight convulsion, and death occurred six hours later. Examination of the brain revealed a ruptured aneurism of the right internal carotid artery. It was about the size of a small walnut and of solid consistency, owing to contained fibrinous matter. This aneurism caused marked pressure on the right optic nerve just in the front of the chiasma. E. S. T.

Perforating Wound of Globe, With Prolapse of Iris—Report of Case.

White, J. Warren (*Journal American Medical Association,* November 25, 1916). The patient was a man of twenty-three years, whose left eye became injured by a vertical cut through the sclera. The iris was excised and conjunctival flap was made, with good results. E. S. T.

Report of a Case of Tabetic Ocular Crisis.

Michael, J. C. (*Journal American Medical Association,* December 23, 1916). The patient was a man aged forty-two years, with a classical picture of tabes. There was primary atrophy of both optic nerves. He had occasional attacks of short, stabbing pains in the left eye, coming on at irregular intervals and lasting several seconds. During these attacks he saw momentary flashes of light before the affected eye, and also felt irritation in the eye resembling that caused by a hair. The conjunctival mucous membranes became reddened during the attack, and the eye became moistened with tears. These attacks continued until his death, four months later.

E. S. T.

A Case of Gumma of the Sclera.

Blake, Eugene M., and Lane, John E. (*Journal American Medical Association,* December 30, 1916). The case was a man of thirty-eight years. A small red spot appeared on the sclera of his left eye, about three millimeters from the margin of the cornea. It measured four by six millimeters, and was raised approximately three millimeters above the level of the surrounding sclera. It was yellowish red, slightly tender, distinctly hard, and covered by dilated conjunctival vessels. Neosalvarsan was given, and the growth gradually disappeared. E. S. T.

The Visual Requirements of Military Aviators.

SMALL, CHARLES P. (*Journal American Medical Association,* March 17, 1917). "The successful applicant for army aviation service should have:

1. Uncorrected vision of 20/20 in each eye.
2. Binocular vision.
3. Absence of nystagmus.
4. Normal muscle balance and competent ocular muscles.
5. Normal pupillary reaction and no pupil irregularities when dilated.
6. Normal media and fundi.
7. Normal visual fields by perimetric examination.
8. Normal color sense." E. S. T.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

M. W. FREDERICK, M. D.,

SAN FRANCISCO.

JESSE S. WYLER, M. D.,

CINCINNATI.

A New Model of an Ocular Electrode Carrier for Ionization Treatment of the Eyeball.

DE GUILLEUMA, SIMON (Modèle nouveau d'oeillére porte-electrode pour le traitement électroionique du globe de l'oeil, *La Clinique Ophtalmologique,* November, 1916), advocates this form of treatment, and mentions the essentials necessary for a perfect electrode. These are: (1) Ease of cleansing. (2) Transparency, so that the operator has constant view of his subject's eye. (3) Perfect adaptation to the contour of the lids. (4) Freedom from secondary action of the electricity upon the container. (5) Absence of variation of the effects upon different metals. Therefore, the author constructed a glass electrode very like an ordinary eye cup, into which extends a carbon electrode. The cup has two openings, to one of which is attached a rubber bulb. By means of this the fluid is injected into the cup after it is put in position on the eye. The other opening is to allow the escape of the gases formed in the process. An illustration accompanies the article, and the device seems simple and practical for those who have faith in this form of therapy. J. S. W.

The Diagnostic Value of Choroidal Tubercles.

STEPHENSON, SYDNEY (De la valeur diagnostique du tubercule de la choroide, *La Clinique Ophtalmologique,* November, 1916), discovered three distinct cases in children at Queen's Square within the course of two months, and thus emphasizes the fact brought out by Marple, that in meningitis this finding is far from rare. He uses euphthalmin and an electric ophthalmoscope, and does not hesitate to give a few whiffs of chloroform if necessary. The author describes his findings in detail. First case was seven years old, thought to be pneumonia, but recognized as miliary tuberculosis upon finding the tubercles in the choroid. The second child was six years of age, admitted for appendicitis. The exploratory incision revealed a tuberculous peritonitis, and the ophthalmic findings showed the condition to be an acute one.

The other case was three years old, and the diagnosis rested between pneumonia and typhoid. All these children died, and the diagnoses were confirmed postmortem. J. S. W.

Report of the Use of Thiosinamin Subconjunctival Injections in a Case of Recurring Hemorrhage of the Vitreous.

Westphal (Note sur l'emploi de la thiosinamine en injections sous-conjonctivales dans un cas d'hemorrhagies récidivantes du vitré, *La Clinique Ophtalmologique*, November, 1916) describes a case of this condition in a young girl, with considerable improvement in a supposedly hopeless eye. The author draws the following conclusions: (1) More than two injections weekly do not hasten the recovery. (2) Two milligrams of thiosinamin is the maximum dose. (3) A strong dilution causes conjunctival necrosis without benefit.

Westphal used one-tenth of a cubic centimeter, which contained thiosinamin, 0.01 centigrams; antipyrin, 0.0075.

J. S. W.

Melanosarcoma of the Orbit Following Three Excisions of the Tumor. Subperiosteal Evisceration of the Orbit, Followed by Two Deep Applications of Radium. No Recurrence After Thirteen Months.

Darier (Mélanosarcome de l'orbite-après trois ablations de la tumeur eviscération sous-périostée de l'orbite suivie de deux applications profondes de radium. Pas de récididive depuis 13 mois, *La Clinique Ophtalmologique*, November, 1916). The title fully describes the case, of which a complete history is given. After the radical operation the orbital cavity was lined with five metal tubes, each containing twenty milligrams of radium sulphate, and these allowed in place for twenty-four hours. There was no pain. A month later the same treatment was done with only three tubes, the filler being five-tenths millimeter of platinum. Complete anesthesia of the first and second division of the fifth cranial nerve followed. However, nothing unforeseen has arisen in this case in thirteen months, which is a much longer period than any which elapsed before the radiation. Time alone will prove the ultimate result. J. S. W.

Eight Observations of Undiscovered Intraocular Foreign Bodies.

Dor (Huit observations de corps étrangers intraoculaires ayant passé inaperçus, *La Clinique Ophtalmologique,* December, 1916) reports briefly at the army meeting in Nancy the history and results of these unsuspected injuries. One of these cases had been examined by three specialists, and another by five, and yet the cause of the trouble was not perceived. The causes were varied, and the symptoms were those of acute inflammatory glaucoma, intraocular infection, or traumatic cataract. The point of entrance was always in the sclera, so after a few days the wound was no longer discernible. The radiogram always revealed the foreign body, although in two cases, too late for any material benefit.

J. S. W.

The Homeopathic Treatment of Cataract.

Parenteau (Du traitement homoeopathique de la cataracte, *La Clinique Ophtalmologique,* December, 1916) describes his methods in an article so unscientific and unconvincing that the reviewer is surprised at its acceptance by the periodical. Parenteau admits that it will not cure all cataracts, but even in three case reports, the results do not seem noteworthy. The method is based upon two medicaments: the one a constitutional remedy which will correct the defective circulatory drainage, depending upon the cause which produces the lenticular sclerosis; the other, the symptomatic drug which combats the lesion itself. Magnesium carbonat, in the various increasing dilutions, only understood by followers of this branch of medicine, is used for its constitutional action, and this is alternated with secale cornutum. The treatment is continued for three to six months. Several other drugs, not often used by regular practitioners, are employed. J. S. W.

Some Observations Upon Trachoma.

ZIMMER (Quelque observations sur le trachome, *La Clinique Ophtalmologique*, December, 1916) sees in the war a cause for the dissemination of trachoma. He found, in ten months' military service, the disease in twenty-seven per cent of his cases, and during his captivity in Germany he found that fifty per cent of the Russian prisoners were afflicted. There can be no doubt as to the contagiousness of the trouble contracted by common use of linens and toilet articles. The diagnosis is easy after seeing a few cases. The cardinal symptoms and gross lesions are briefly described. Rapid improvement was noted under ten per cent copper sulphate in glycerin. The regular routine procedures are advocated in the various stages and complications. J. S. W.

Treatment of the Iris and Ciliary Body in General.

DARIER (Traitement des maladies de l'iris et du corps ciliare en general *La Clinique Ophtalmologique,* January, 1917). This is another part of Darier's book upon ocular therapeutics, to be published after the war. In acute irites an early and exact diagnosis is important. If in doubt, a drop of adrenalin and cocain will make a conjunctival hyperemia disappear, but the violet congestion around the cornea will remain in the uveal condition. Care must be taken not to overlook a glaucoma, as the treatment is the exact opposite. The cause of iritis is always due to an infection which may be local or constitutional. The discovery of the cause is as important as the recognition of the disease. The sinuses, teeth and other neighboring structures should be examined, and Wassermann and gonorrheal complement fixation and tuberculin tests must be made.

Upon making the diagnosis, a one per cent atropin solution, followed by a drop of five per cent dionin, is used. The latter drug is used for both its lymphagogic and analgesic effect.

When maximum dilatation of the pupil is obtained, the atropin is continued two to three times daily, and the eye protected by means of a smoked glass or shield. The other medication is according to the etiology. When the pain is violent, antipyrin, phenacetin, quinin, and the various salicylic preparations are administered. Serotherapy paraspecific will occasionally relieve pain after drugs have failed. Hot compresses increase the action of the atropin. If the atropin fails, the author finds the following more powerful: Scopolamin, HBr, 0.025; cocain, 0.25; water, 10.0. Powdered atropin is recommended by Fuchs. Adrenalin, instilled with the atropin, has a tendency to increase the mydriasis. Recourse to bleeding, either by leeches or artificial measures, renders service in violent cases which cannot be controlled. Two to four leeches are applied to the temple, in front of the hair, and a single leech at the inner angle of the lids. Care must be taken not to place them too close to the eye itself. When the inflammation is deep, the bleeding should be done over the mastoid. In case this fails, a paracentesis of the anterior chamber under general anesthesia is the last measure. The bowels must be energetically purged with calomel. Various cutaneous counter irritants (blisters, cautery, mustard baths) are even today recommended by some.

In cases of chronic iritis of the "quiet" type, cures often take several years, depending upon the specific cause, which must receive systemic treatment. After the first fifteen days, when the very acute symptoms have subsided, Darier advises subconjunctival injections of cyanid of mercury 1/5,000 every few days. These are valuable, especially in gummata of the iris. This procedure, however, is only to be used as an adjuvant to other medication in severe cases. Subconjunctival injections of sterile air have been successful in tuberculous inflammations.

The operative treatment consists in an iridectomy, to break the adhesions and allow free drainage of the anterior chamber. The author's method, especially where the chamber is shallow, is to use two keratomes, one in each hand, penetrate the cornea and divide the uncut limbus with a straight knife. (The reviewer fails to see the advantage over an ordinary linear knife incision in the periphery of the angle.) (To be continued.)

J. S. W.

Bilateral Metastatic Cyclitis Following an Attack of Bubonic Plague.

ZIMMER (Cyclite métastatique double, consécutive a une atteinte de peste bubonique, *La Clinique Ophtalmologique*, January, 1917) describes the case of an Italian taken with sudden fever, a pustule in the right axilla, and loss of vision. Bacteriologic and clinical diagnosis demonstrated the plague. The eyes showed slightly increased tension, mild injection, posterior synechia, exudate in pupil, infiltrated vitreous so the fundus was not visible. Anterior chambers were normal, and no visible nodes were seen. The patient was cured of the disease, but the blindness was permanent. J. S. W.

The Functional Disability of the Aphakic in War Wounded. His Valuation.

TEULIÉRES (La gene fonctionelle de l'aphakie chez les blessés de guerre. Son évaluation, *La Clinique Ophtalmologique*. January, 1917) goes thoroughly into the various aspects of traumatic cataract and its extraction, and considers the damage to the injured. The judges decided that because binocular vision was lost, the damage was equivalent to loss of one eye. This was in civil practice, but in war times, in reference to pensions, different standards must be taken. The author has four classes. The first, where the loss of the lens in one eye is equivalent to the loss of the visual function, because binocular vision is gone. The indemnity is fixed at ten per cent.

The second class is where one eye was previously useless; therefore, after operative recovery of the other eye, no binocular vision bing lost, the rate is only five per cent.

The third class is where, after operation upon both eyes, one is lost; and the other regains useful vision. Here the rate is fixed, as in the second group, at five per cent.

The fourth group contains those who have poor vision after both eyes are operated upon, and here fifteen per cent is allowed. When useful sight is obtained in both eyes after operation, the damage is not estimated. J. S. W.

ABSTRACTS FROM SPANISH OPHTHALMIC LITERATURE.

BY

WILLIAM H. CRISP, M. D., OPH. D. (COLO.),

DENVER.

Mercurial Treatment of Nonsyphilitic Affections of the Eye.

SANTOS FERNANDEZ, J. (*Archivos de Oftalmologia,* March, 1917). We frequently explain as syphilitic a number of obscure conditions in the eye which are successfully treated with mercurials. It is possible that a number of these cases are really not syphilitic in character, although we are unfortunately not in possession of evidence to prove this conclusively. Santos Fernandez recites briefly a number of cases from his experience in which diseases not definitely proved to be always syphilitic in character were successfully handled with mercury.

Opaque Optic Nerve Fibers—An Exceptional Case.

MENACHO, M. (*Archivos de Oftalmologia,* March, 1917). A number of cases are described, in several of which the opaque nerve fibers were coexistent with congenital cataract. In the most interesting case, well illustrated in black and white, the left eye showed a large expanse of opaque fibers, which began at the optic disc, and covered a rhomboid area about twenty-two times as large as the optic disc, and extending slightly to the nasal side of the disc above and below, about three-fourths of the expanse being above the level of the disc and one-fourth below. Above and below the macula the fibers suggested by their striations a curved direction more or less concentric with the macula. From a point about midway between the temporal side of the disc and the macula there was a dehiscence in the expanse of fibers running horizontally to the temporal edge of the opaque area, and measuring vertically about a half disc diameter. The macula had undergone extensive destruction, showing areas of white sclera and localized deposits of pigment.

Ophthalmoscopic Examination Preliminary to Treatment With Ehrlich's Arsenic Preparations.

BLANCO, TOMAS, Valencia (*Archivos de Oftalmologia*, March, 1917). In every case, before injections of arsenobenzol or neoarsenobenzol are given, an objective and subjective examination should be made of the condition of the optic nerve and the intraocular membranes. The discovery of even slight disturbances indicates cautious handling of the case, the patient and the syphilographer being warned against the possibility of an aggravation of the existing ocular condition. Such a preliminary examination will not only serve to clear up certain points which have been doubtful or debatable hitherto, but will also avoid disagreeable contingencies.

A Case of Malarial Amblyopia.

MARQUEZ, M. (*Archivos de Oftalmologia*, March, 1917). The patient was a physician. The disturbance complained of was a steaminess of vision, first noticed in the morning, and persisting during the day. Three days later a sudden pain was felt in the same eye. This pain subsequently disappeared, but left the eyeball and the surrounding parts very sensitive. The cloudiness of vision increased. Malaria being suspected, quinin was administered, the result being a rapid disappearance of the symptoms complained of.

Operative Treatment of Infantile Cataract.

TUTO, R. (*Archivos de Oftalmologia*, March, 1917). From a study of modern literature the author concludes that the present day tendency of operators is to abandon simple discission and to employ in every case extraction of the lens substance, or at most to resort to simple discission only in liquid or milky cataracts. In the operation by extraction through a linear opening, Tuto considers that iridectomy is advantageous because it facilitates every maneuver in the pupillary region, and because especially it renders possible, without wounding the iris, an extensive capsular opening with cystotome. On the other hand, iridectomy does not always avoid incarceration of the iris, it renders the operation more complicated, and it produces a more marked postoperative reaction which is slow to disappear. Linear extraction in two steps has all the advantages with none of the inconveniences of the method of extraction combined with iridectomy.

The Simplest Explanation of Skiascopy.

BLANCO, TOMAS (*Archivos de Oftalmologia,* April, 1917). An article by Landolt, entitled "A Simple Explanation of Skiascopy," is criticised as having been rather complicated than clear. This article undertook to explain the phenomenon of the displacement of the zone of intraocular illumination by the study of the image of the observer's pupil in the interior of the eye of the person observed. Blanco gives a rather lengthy explanation of the matter, along lines which he says he has used for years with his students. This explanation is based fundamentally on the comparison of the eye of the patient with a house, through a door or other opening in which rays of sunlight fall upon the opposite wall. As the position of the sun in relation to the opening is changed, so the illuminated area of the opposite wall will shift, and so on.

In place of the various terms so far proposed for this method of determining the refraction of an eye, keratoscopy, retinoscopy, refractoscopy and skiascopy, Blanco suggests as more appropriate and expressive the word "cineluzcopia," Spanish in form, and for which apparently the most satisfactory equivalent of English formation would be "cineluminoscopy." This expresses at the same time the idea of movement of light and of inspection or exploration. The word "corescopy," proposed by Landolt, is unsatisfactory, inasmuch as it is not the pupil which is under observation, but the background of the eye.

Orbital Osteoma.

BLANCO, TOMAS (*Archivos de Oftalmologia,* April, 1917). The patient was a woman of nineteen years. The tumor was noticed as a prominence between the left eyeball and the upper orbital margin. It had been first noticed three or four months previously. Radiography, as rather commonly in such cases, did not offer very satisfactory information, with the partial exception of a view taken from the left side. The left eyelid was not raised quite so high as the right, the left eyeball was somewhat exophthalmic and somewhat lower than the right. There was, however, no diplopia, except when the eyes were turned far to the left and downward. The diplopia which then appeared was homonymous, the left eye evidently being retarded in relation to the right. The tumor was extirpated, using a saw worked with a small foot motor such as is employed by dentists, and entering through an incision in the line of the eyebrow. The tumor, which in its fresh condition weighed 5.4 grams and in the dry condition 3.2 grams, was an eburnated osteoma as regards its surface, but with a more spongy interior. References are given to twenty-four analogous cases mentioned in the literature consulted by the author.

Convergent Strabismus of the Newborn.

Poyales, Francisco (*Archivos de Oftalmologia,* April, 1917). The frequently observed convergent strabismus of the eyeballs at birth is discussed, especially according to the classification of Galezowsky, who grouped the causes under optical—that is, infantile hypermetropia; paralytic—that is, disturbances of development of the coordination by the brain centers; and mechanical—that is, absolute predominance of the internal rectus over the external. The two important factors which determine the disappearance of the convergent strabismus of the newborn are, first, the combined action of all the muscles of the oculomotor system, and, second, the action of light on the retina; these two factors stimulating and producing a normal relative position of the two eyeballs.

Traumatism at the Level of the Palpebral Sulcus of the Left Lower Eyelid, and Paralysis of the Abducens of the Right Eye.

Tuto, R. (*Archivos de Oftalmologia,* April, 1917). The patient, a workman thirty-three years of age, who had always enjoyed excellent health, had fallen a week previously, receiving a blow below the left eye. Simultaneously with the fall and the traumatism there had been profuse epistaxis, so severe that the patient had fainted. At the time of examination there was moderate dilatation of the left pupil. At the internal third of the palpebral sulcus of the left lower lid was a slight scar about sixteen millimeters long. The movements of the eyeball and eyelids were normal. The only symptom as regards the right eye was paralysis of the external rectus. The fundus of each eye was normal, and with the retinoscope there was a slight myopic astigmatism.

Ocular Syndrome of Mongolism.

DE CARALT, DELMIRO (*Archivos de Oftalmologia,* April, 1917). The two cases described presented the following characteristics, in association with the idiotic condition of the mind: Small oblique eyes, convergent strabismus, noticed from birth, high oblique myopic astigmatism or mixed astigmatism, and pseudoconjunctivitis or dacryocystitis of congenital origin. In one case nystagmus was also present.

SOCIETY PROCEEDINGS.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Regular meeting, held March 19, 1917. Dr. Paul Guilford, the president, in the chair.

Two Cases of Socalled Acute Inflammatory Glaucoma Relieved by Eserin.

Dr. A. M. Carr: Case 1.—A man, aged thirty-nine years, was first seen February 8, 1917. He complained of severe pain in the left eye; there was no blurring of vision, no colored rings about lights. In the evening the left pupil was larger than the right and the pain more severe, but he slept until about four a. m. The pain then became very severe, and he saw colored rings about the lights for the first time.

Examination.—Left eye, general ciliary injection, cornea slightly hazy, no corneal precipitates; anterior chambers both alike; iris slightly darker than right; pupil six millimeters round and fixed to light; disc not cupped; left tension distinctly higher to fingers, the Schiötz reading was 47.5 millimeters; right, 14.5 millimeters; vision, 1/0 plus 2; right, 6/8.

Eserin salicylate, one-half per cent solution, was instilled into both eyes; the tension was definitely lowered, pupils narrowed to one millimeter.

General Examination.—Teeth dirty; pharynx slightly congested; tinea versicolar on chest; moderate general enlargement of the lymph nodes; some hypertrophy of the left ventricle, with a faint diastolic murmur at apex only; left lobe of prostate firm, some tenderness. Blood pressure, systolic, 126; diastolic, 66. Urine negative.

Focal infection study showed positive tuberculin reaction, giving temperature of 101.4° F. with four milligrams of old tuberculin at the thirty-second hour; fluoroscopic examination of the chest negative for tuberculosis; cloudy right antrum, no pus; no pus in tonsils; strongly positive Wassermann.

Diagnosis.—Acute inflammatory glaucoma in the presence of active lues.

Treatment.—Miotic treatment to left eye continued for six days. The tension did not rise above fourteen millimeters after the second day. Eserin was then stopped to learn what would happen if the pupil was allowed to return to normal size. In the meanwhile a subcutaneous tuberculin test had been undertaken. After forty-eight hours, at the height of his reaction (temperature, 101.4° F.), the left tension rose to forty-two millimeters, with a pupil of but two millimeters. One-half hour thereafter both pupils were found to be widely dilated (eight millimeters). One hour later, despite the pushing of eserin, the left pupil remained eight millimeters, right contracted to three millimeters. There was distinct arterial pulsation of left disc. During the succeeding five days no eserin was used, and tension remained below fourteen millimeters. The tuberculin test was then repeated, but no increase in tension and no dilatation of either pupil occurred.

The visual fields were of special interest in this case, particularly those of the right eye. They showed the form found in primary optic nerve atrophy, rather than the nasal limitation found in glaucoma.

Case 2.—A man, aged thirty-three years, was seen on November 1, 1916, at eight p. m., complaining of severe pain in his right eye, nausea and vomiting.

Previous History.—Struck in the right eye with fist, five months before. October 27, 1916, he came to the hospital for refraction.

Diagnosis.—Probably rupture of the choroid. Atropin was prescribed for the fellow eye for refraction. Gonorrhea eleven years ago; hard chancre three years ago, continuous treatment since. Heavy drinker until three years ago; smokes excessively.

Examination.—November 1, 1916. Right eye, complete ciliary injection; some chemosis, cornea slightly hazy, pupil virtually oval, five by six millimeters, sluggish in reaction; iris slightly greenish yellow; anterior chamber very shallow; tension distinctly elevated to the fingers, and Schiötz 52.5 millimeters. Left tension, 14.5 millimeters; pupil, 6.5 millimeters. Patient stated positively that he did not put atropin in his right eye. Eserin salicylate, one-half per cent solution, was instilled into the right eye. The pain was relieved and vomiting stopped.

General Examination.—Left inferior turbinate enlarged; deviation of the nasal septum to left; mucous polyp in right nares; general enlargement of lymph nodes. Blood pressure, systolic, 160 millimeters; diastolic, 110 millimeters. Urine negative.

Under eserin, the next morning the right pupil was 1.5 millimeters; tension, 8.5 millimeters; cornea almost clear; almost an anterior chamber; plus ciliary injection and chemosis; right vision, 12/200.

The next day tension of the right eye was seven and one-half millimeters. Holocain dilated the pupil to six millimeters, but gave absolutely no rise in tension, and contracted again readily after eserin.

Discussion.—Dr. E. V. L. Brown said that in view of the temporal limitation of both visual fields in the first case, and the positive blood and spinal fluid tests, he would consider it to be one of early primary atrophy of the type found in tabes, and the acute inflammatory glaucoma to be an independent phenomenon.

In the second case he thought it quite possible the patient got some of the atropin into the eye which became glaucomatous.

Dr. William H. Wilder asked Dr. Brown what his conception was of the way in which atropin might produce attacks of glaucoma, and whether he had any idea that it might produce it in any other than a mechanical way which would be explained by the Weber-Knies theory. He said that as he remembered the record, there was a large pupil when this attack occurred, and the relation that that bore to the production of the glaucoma was interesting. He also asked what was the relation of the physiologic cup to the rest of the optic disc —was it entirely on the nasal side?

Dr. E. V. L. Brown said that when the second attack occurred in the first case during the use of tuberculin, no atropin had been used for two days; there was a temperature, and when the tension was taken it was forty-two, and some hours afterward the pupil had enlarged to six millimeters. The tension had been down to seven or eight, and he thought it was the tuberculin that caused the change. He said the Knies-Weber theory appealed to him very strongly, and he thought the glaucoma might be produced by instillation into the eye, and secondarily by the systemic effect by dilating the pupil, in which case he thought there was a mechanical effect. The second time they did not get the glaucoma; the tension was kept down for five days, and then three milligrams of tuberculin were used. There was a temperature of 103° F., but no dilatation of the pupil; the tension remained down, and the eye had shown no further tendency toward a glaucomatous condition. They then dilated the pupil with atropin and got no tension. He said that in many cases of primary glaucoma there was a fever right along; and in many cases where one eye was involved and the other eye not involved, the visual fields were taken, and there was limitation of the temporal field. He thought the other case should be studied with regard to the primary optic atrophy of tabes. He said they had watched the case carefully, and the cup was not on the nasal side. In one case they had atropin in the other eye and got an infection, and he had seen cases in which the cups were small.

Dr. Harry Gradle was reminded of the case of a middle aged woman with a large family, who came in for refraction in 1899. She returned in 1903 with a glaucoma simplex, with a shallow excavation which extended almost to the edge of the disc. In 1907 his father did an iridectomy on each eye, which kept the tension down; the vision gradually decreased and the disc became paler. In 1911 she complained of various vague pains in the limbs, and Dr. Grinker reported a well developed tabes, which explained the lowering of the vision with the atrophy of the disc without any tension. The pupillary reaction was out of the question. Since that time her vision has remained about stationary. She had the temporal limitation of the fields which started early, before the iridectomy was performed.

Dr. Robert von der Heydt said he had recently seen a patient with a third nerve paresis in whom the dilated pupil brought on mechanically an acute attack of glaucoma. He thought the origin of the acute attack of glaucoma was interesting, as it was the result of dilatation of the pupil in a syphilitic constitutionally predisposed to glaucoma.

Dr. Charles F. Burkhardt, of Effingham, Illinois, was much interested in the report of these two cases, because he had been treating a similar patient at long intervals for the past five years. The patient, aged fifty-eight years, has acute attacks of glaucoma in the left eye which last, as a rule, about six or seven days, and he has been able to get fairly good results and have the condition cleared up by the use of one-half of one per cent eserin solution. He said he had on several occasions suggested that perhaps an iridectomy would be the best thing, but the patient would not submit to it.

Dr. George F. Suker thought it was interesting to find that the man was syphilitic, and the mere fact that he had a limitation in the temporal field was significant of the fact that he had what might be called the higher type of tabes, and therefore the glaucoma which he had was one just as Dr. Brown had attempted to explain. He thought it could be demonstrated that the patient was entirely well of the glaucoma, but if the case was watched further, it would be seen that the retraction of the visual field would extend to the nasal side, and then there would be a uniform concentric contraction which was typical of tabes or a perineuritis. He thought he would not ascribe the glaucoma symptoms as a whole to syphilis or its toxin, and advised heroic antisyphilitic treatment, particularly large doses of salvarsan, followed by mercury, but no potassium iodid. Syphilis per se has not up to the present time been considered as an etiologic factor for glaucoma. One would not want to deny the possibility, but the probability is certainly an extremely doubtful one, even in the face of the bizarre activities of syphilis.

Two Cases of Sympathetic Ophthalmia, With Anatomic Findings.

Dr. E. V. L. Brown reported these cases, as follows:

Case 1. Sympathetic Ophthalmia With Whitening of the Lashes.—S. Davis, aged sixteen years. The left eye suffered a penetrating steel wound in April, 1916, and was operated for traumatic cataract seven weeks later. Sympathetic inflammation developed in the fellow eye in the eleventh week, and enucleation was performed in the fifteenth week. Examination in the seventh month showed a sympathetic iridocyclitis with precipitates, thickened and vascularized iris, and dense pupil membrane, with secondary glaucoma. A large number of the lashes of all four lids became dead white early in the disease. The tension gradually declined. The tonsils were removed and mercury rubs and benzosalin used for five months with effect. Sections of the primary eye showed the typical findings.

Case 2.—Sympathetic Iridocyclitis and Choroiditis, With Preservation of Useful Vision in the Sympathizing Eye.—T. Irving, aged thirty-two years. The left eye had a recurrent luetic iridocyclitis with secondary glaucoma, for which a trephining was done in November, 1912. About thirty months later vision became blurred in the fellow eye, and in the thirty-fourth month both eyes showed the type of uveitis most frequently found in sympathetic disease—viz.: thickened tumefied irides with precipitates. There was a rich net of new-formed vessels on the primary iris. The enucleated primary eye showed the typical changes. Mercury and benzosalin were also used in this case, and a tuberculin course given. Marked improvement did not occur, however, until infected tonsils were removed, when vision cleared to 4/10, and has remained this acute for fourteen months. Innumerable round and slightly irregular discrete and confluent yellowish flecks are now to be seen in the equatorial and anterior choroidea, especially below. None of them are definitely white, indicating that the choroidea is nowhere atrophic through all its layers. Only moderate pigmentation is present.

Report of Two Clinical Cases of Sympathetic Ophthalmia.

Dr. Charles G. Darling: Case 1.—L. J. J., first seen November, 1916. He had been hit seven years previously with an iron bolt, which ruptured the right eyeball; the eye became quiet after four months, but would become red and painful at times. Two months previously the left eye began to fail, and two weeks previously he could not see to read.

Examination.—Right eyeball atrophic; slight ciliary injection, no light perception. Left eye, photophobia, lacrimation, slight ciliary injection; numerous very fine deposits on Descemet's membrane. Aqueous cloudy, iris greenish in color; pupil sluggish, dilated fully on the use of atropin; some pigment spots on anterior capsule.

Treatment.—The blind stump was at once removed and treatment begun with atropin, dionin, inunctions of mercury, sodium salicylat, sweats, and hot applications to eye. The sight steadily improved, so that by the end of December it was 20/50. Vision now 20/20 with a plus 2.00 cyl. Sections of the enucleated eye show a degenerated eyeball with bone formation; nothing typical of sympathetic; possibly such a change may be shown on examination of other parts of globe.

Case 2.—J. K., seen October 26, 1916. There was a history of inflammation in the right eye for the past two months; no history of injury.

Examination.—Photophobia and lacrimation in right eye; slight ciliary injection, cornea clear, iris greenish, pupil small, no reaction to light; vision, 20/200. Left eye, marked ciliary injection, cornea cloudy, a black spot showing where there had been a perforation of cornea with adherent iris root. Lens dislocated forward. Vision, light perception faintly; no projection. X-ray examination, no foreign body. Tonsils showed pus in both. Wassermann, tuberculin test, 10 millimeters X. R., negative; no leucocytosis.

Treatment.—Left eye was removed. Right pupil dilated, two per cent atropin and cocain. Inunctions of mercury, sodium salicylate, atropin, removal of tonsils, after which sight improved, reaching 20/70, falling again to 20/200 five days later.

New vessels seen in iris December 11th. Vision gradually fell—fingers January 6th at one-half foot. The eye that was removed shows typical picture of sympathetic inflammation in all parts of the choroid.

Two points of interest in this case are the sympathetic inflammation as the result of a small perforating ulcer of the cornea, and the absence of a keratitis punctata in the sympathizing eye until late in the course of the disease.

DISCUSSION OF PAPERS OF DRS. BROWN AND DARLING.

Dr. George A. Darmar cited a case which occurred last year in his practice. He said that in May, 1916, a man struck himself in the face with the end of a wrench, breaking his spectacles. A fragment of glass cut his right cornea, the incision extending from about the center to the edge of the cornea.

The wound healed without complications, but four months to the day after the injury he noticed sympathetic irritation in the other eye. This increased, and two days later Dr. Harry Gradle saw the case in consultation, and advised immediate enucleation of the eye, which was done. Four days later the patient became nervous and irritable; he was naturally a very quiet man, but the nervousness increased for forty-eight hours, when he became violently insane, and although he was a man of exemplary habits and clean speech, for thirty-six hours there was a constant stream of profanity and obscenity. At the end of this time he slept for about six hours and awoke in an exhausted state, with very little recollection of what had occurred. He said he had looked up the literature and found that this was an almost typical case of postoperative psychosis which Krafft Ebbing had described, but which more frequently occurs in women following childbirth, although they are frequently seen following operations on the eye or genitalia. He stated that the patient was now practically well, with vision 20/20 plus in the remaining eye.

Dr. William H. Wilder said one point which struck him as Dr. Brown was describing his case of increased tension in the course of the sympathetic ophthalmia was the question of operation, and he was interested to know that he had shown his great sagacity in refraining from operation, even though it seemed to be indicated. He thought that was a point which was well worth considering in connection with any case of sympathetic ophthalmia in any stage, for the reason that the inexperienced ophthalmologist, who had not seen a number of these cases through long periods of time, might easily be tempted too early to resort to operative interference. If there was any one thing in connection with the treatment of these important cases which should be emphasized, it was to absolutely refrain from operative interference even months and months after the subsidence of the last symptom. He thought the most that might be done would be paracentesis, which might be accomplished with safety; but if there was anything brought home to him in the treatment of this disease, it was that one should not jump in "where angels fear to tread." He was convinced that no operation should be attempted so far as restoration of the vision was concerned, if poor vision had resulted two or three years after the subsidence of all symptoms.

Dr. Wilder considered Dr. Darling's case interesting in showing how a comparatively simple injury might be instrumental in bringing on this disease, but he thought that such cases following perforating ulcer of the cornea were rare.

Dr. E. V. L. Brown, in closing, said he was glad to learn that Dr. Wilder was also opposed to operation on sympathizing eyes. He cited two further cases in which operations for tension had caused only an aggravation of conditions.

Dr. Charles G. Darling, in closing, stated that the precipitates on Descemet's membrane first occurred thirteen days after the patient entered the hospital. He had always thought that finding the precipitates on the posterior wall of the cornea was one of the first signs of the beginning of sympathetic ophthalmia, but in this case the precipitates did not appear until the eye had been inflamed for over a month.

Preliminary Report on Several Cases of Lateral Ventricle Injections of Mercury for the Optic Atrophy in Tabes and General Paresis.

Dr. George F. Suker thought it was necessary to reconstruct the generally accepted conception of socalled primary tabetic atrophy, in so far that the process of atrophy is not an ascending one, originating in the retina and then proceeding into the nerve, but that it virtually is a typic secondary optic atrophy, starting as a neuritic process somewhere in the nerve, and then descending to the disc. He stated that up to the present time every form of treatment of the atrophic process had been an utter failure; that experimentally on the lower animals it had been conclusively proven that intraspinal injections never reach the optic nerve to be of any intrinsic merit in treating optic nerve lesions, but that the subarachnoid or intraventricular injection had been proven experimentally to reach the optic nerve, and had given up to date the most promising results, it having been shown by numerous cases that repeated injections could be made into the subarachnoid spaces without entailing untoward after-effects, provided the injections were made with good judgment. He said the number of cases treated up to the present time was not sufficiently large to warrant the dictum that it is the sine qua non method, but he considered it a method worthy of further trial in selected cases. He reported seven cases which he had treated by this method, and exhibited photographs showing the method of procedure. Each of the cases had had a series of five to six injections, ranging from 1/100 to 1/20 grain of bichlorid; the interval between injections varied from ten to fourteen days, and two had been at intervals of one month. All cases were treated in addition with mercurial rubs and iodids. From five to forty cubic centimeters of ventricular fluid were abstracted, and one-half the amount, with the addition of the bichlorid, was slowly reinjected into the ventricle. The first injection was made under general anesthesia, and the subsequent ones under local. They were always made on the right side of the brain into the right lateral ventricle, so as to damage as little as possible any of the functionating brain centers. He emphasized the fact that care should be exercised not to pass the needle through any of the dural vessels. He said if the ventricle was not reached upon the first insertion of the needle, the same, with obturator in, has been raised and lowered each time, withdrawing the fluid with syringe, then waiting several days or a week before attempting the insertion again, in this way avoiding undue traumatization of the brain tissue and thwarting cortical and subcortical irritation. He stated that blood stained serum must not be reinjected with the mercury, as it was certain to invite trouble; but that so far all annoying symptoms which had appeared subsequent to the injection have never remained permanent nor continued longer than three weeks. Caution must be observed when the serum is reinjected to have the inserted needle filled with fluid so that it drips, in order not to force air into any of the ventricles.

Regular meeting, held April 16, 1917. Dr. Paul Guilford, the president, in the chair.

Ocular Disturbances in Pregnancy.

Dr. Burton Chance, of Philadelphia, by invitation, reviewed the subject of disturbance of the sight and disease of the ocular structures arising in the course of pregnancy, and pointed out how certain symptoms are indicative of the gravest danger to the life of the woman, or portend the destruction of her sight. Such disturbances, he said, might arise from many causes, but the conditions chiefly considered by him were the affections of the retina, choroid and optic nerve arising in the course of the toxemia of pregnancy, wherein there is retinochoroiditis accompanied by exudation and hemorrhage. This form of retinitis must not be considered to be albuminuric in the sense that it is dependent upon the same process which produces an acute nephritis. In this connection, it is well to remember that ordinary chronic nephritis might be present before the first pregnancy, and the further fact that acute renal retinitis may develop during the course of pregnancy. Undoubtedly, the retinitis depends upon disturbances in the kidneys, but the proximate cause is the toxemia which brought about the disturbance. The nephritis is not a true acute inflammation, but rather a fatty degeneration of the tubal epithelium which in favorable cases is replaced by healthy cells. In the less favorable cases a chronic nephritis may ensue with increased rapidity. The epithelium of the kidneys of the pregnant is sensitive to toxins, and it is this sensitiveness, perhaps, which causes the albuminuria, while more pronounced disturbances might cause severe nephritis.

The ophthalmoscopic signs may not differ from those observed accompanying other forms of nephritis. In general terms there is a widespread neuroretinitis with exudation and hemorrhage. The retinitis is toxic rather than vascular in origin, although endarteritis has been found. In the vast majority of cases, however, the findings are such as to allow us to suppose that the changes throughout the system are of a temporary nature. Few eclamptic cases show evidences of retinitis, and the star figures are rarely found.

Acidosis from imperfect hepatic action is commonly associated with toxemia. Its exact relation is not definitely established, although it is a well-known clinical fact that when acidosis is corrected the general symptoms are relieved.

The onset of the symptoms is relatively prolonged; the disturbances of sight may vary from absolute blindness to temporary obscurations, direct and peripheral. The prognosis in pregnancy is usually better than in the nonpregnant state, but it depends upon the location of the lesion and whether or not pregnancy can be terminated.

In general, it may be said that retinal hemorrhages usually indicate a grave toxemia. If the hemorrhages are over the macula, and if the optic nerve is involved, while the symptoms are not heeded, during which time the toxemia becomes increased, a permanent impairment of vision is inevitable.

The prognosis as regards sight in these cases is probably not so good as is commonly thought, though as regards life it is much better than in the nephritis of the nonpregnant. Sight, however, never improves until the pregnancy is terminated. The ophthalmoscopic examination when positive enables one to make an early diagnosis of the underlying condition, which is sometimes by other methods difficult or impossible. Cases which go on to term show the largest proportion of deaths and the greatest damage to sight. Spontaneous premature delivery shows eleven per cent of deaths, while after artificial delivery the mortality is but four per cent.

In conclusion the speaker made a plea for the early examination of the eyes of all pregnant women, with the assurance that such attention should help to reduce the mortalities among them and prevent the development of disease in so vital an organ as the eye.

Discussion.—Dr. Charles E. Paddock stated that rarely does an obstetrician see a case of blindness, amblyopia, or albuminuric retinitis even in the preeclampsia state. He differed with the essayist, saying that there are other symptoms before the eye symptom, and thought it was only in the neglected cases that the eye symptoms most frequently appeared. Pregnancy has been called a disease of nine months' duration—conditions are constantly arising which lead us to call it a disease—and of course the eye is not immune. The early nausea and vomiting are often accompanied by certain eye symptoms which are disagreeable to the patient, but which pass away with cessation of the socalled physiologic state.

Dr. Paddock recalled more than one case in the sixth month of pregnancy, where the woman actually had eclampsia and blindness, but she recovered and went to term, the sight improving rapidly before delivery.

Pregnancy is undoubtedly the beginning of many serious eye troubles, and while it has been overlooked in the first pregnancy, subsequent pregnancies increase the affection. No disease is improved in pregnancy, and any woman who has retrogressive eye changes is certainly made worse.

The essayist has said that in acute nephritis, with evidence of injured vision, the pregnancy should be interrupted, dependent upon the time of pregnancy and extent of lesion. Dr. Paddock thought that under such conditions it might be better to empty the uterus, regardless of the time of pregnancy. If a few days' treatment of the toxemia did not change the patient's condition, there would certainly be no excuse for not making a termination, whatever the time in pregnancy. He agreed, with Dr. Chance, that hysteria is quite prevalent, but he had seen only a few cases of hysteric amblyopia in pregnancy, and in these cases the clinical findings are constant and easily diagnosed. We must always remember never to accept the hysteric diagnosis unless we have entirely cleared up all other conditions.

Dr. W. A. Newman Dorland believed that advanced eye symptoms could be very frequently eliminated if the cases were kept under careful observation. The early examination of the urine, not only for albuminuria, but for a lessened urinary toxicity, is very helpful. The axiom, lessened urinary toxicity means increased hemic toxicity, must be borne in mind. That means a rise in the blood pressure, and this starts just as soon as the socalled kidney of pregnancy begins. The kidney is not the seat of a nephritis, but it is a starved kidney, the cells failing to act, not because they are overworked, but because they are not getting enough blood to work upon. The renal cells are deprived of their blood by arteriole contraction, and fail to functionate. The primary action of the toxins in the blood is an almost instantaneous arteriole contraction. This can be proved by administering to any of these patients who are showing a lessened excretion of urine—before there are any eye symptoms—a vasomotor dilator, such as the fluid extract of veratrum viride, and these renal cells which have not been functionating will within three to four hours throw off two or three quarts of urine. An overworked kidney could not do that. The eye symptoms, therefore, result from an accumulation of the toxins in the blood, and these can be eliminated by carefully watching the condition of the urine from the very start of pregnancy.

Dr. George F. Suker differed in his opinion in regard to some of the statements made by Dr. Chance. In the Cook County Hospital there had not been a single case of extraocular complication in pregnancy during the last three years. There had been a good many cases of intraocular complications, particularly in the later stages, in those women who had an increased blood pressure and more or less diminished excretion of urine, although not typically a retention. Several such cases have occurred in the last year, one in particular, with an albuminuric retinitis, the woman becoming absolutely blind within twelve hours after the onset. She was aborted within a few hours after the definite recognition of the condition, and within seventy-two hours had regained practically her normal vision. In this instance the condition was not associated with any hemorrhages, but simply an edematous nerve head which amounted to almost a choked disc. That was the only case with an intraocular complication in a series of over twenty-one hundred cases. Yet, in looking over further statistics and going further back, he did maintain that every pregnant woman in whom an albuminuric retinitis appears must be aborted, irrespective of the stage of pregnancy; because, if this is allowed to go on beyond four or five days or a week, irreparable damage will have been accomplished in the retina, and blindness will result or a diminished visual acuity. Subsequent pregnancies play no part as to the causation. Each case is a law unto itself, and the woman who has such a complication at one time may never have another.

In the large percentage of pregnancies an ophthalmic examination in the seventh or eighth month will show more or less enlargement or fullness of the veins. Not a few have a moderate retrobulbar neuritis, and this is necessarily an evanescent type, and is probably often mistaken for an amblyopia of central origin or of the uremic type. These cases can be cared for without the termination of pregnancy.

In speaking of amblyopia, several things must be remembered: first, is it a retrobulbar neuritis type or a central blindness? If the latter, the patient should certainly be delivered; if it is a toxic amblyopia, this is not necessary.

The conical cornea occurs only as the result of repeated pregnancies, due to the devitalization which ensues. Dr. Suker believed repeated ophthalmoscopic examinations should be made in every pregnant woman.

Dr. Alonzo C. Tenney believed the cases requiring emergency treatment could be narrowed into a very few classes: the gradually developing albuminuric retinitis, the rapidly developing or acute retinitis, the retinitis which is associated with a systemic disease, such as syphilis, and the keratitis associated with the tubercular diathesis or the edematous diathesis. In his experience the indications have been about as follows, speaking from the standpoint of the general consulting practitioner: The gradually developing retinitis may be controlled if caught early.

The appearance of albumin in the urine, with a decreased urea and an increased ammonia ratio, should indicate strict dieting with free elimination. These cases will almost invariably respond to treatment. The acutely developing cases, in patients who only a week or few days prior to this gave a negative urinary examination, require immediate emptying of the uterus. The cases which develop with systemic disease, which seem to be in some instances much more active when the patient's vitality is lowered, should never reach a critical stage, if observed intelligently. By watching the urine (the decreasing urea coincident with the appearance of albumin in nephritis; the appearance of diacetic acid, acetone and creatinin in diabetes; and the discovery of leucin in cases with hepatic insufficiency), the warning may be obtained early enough to use dietetic and medicinal treatment, with a fair prospect of saving the mother's sight and the child's life.

Dr. Francis Lane said the pathologic side of these cases was that the retina and choroid are thickened and soaked with a fluid exudate which is rich in fibrin. There is proliferation of the endothelial cells of the arteries with a thickening of the blood vessel walls.

Dr. Chance, in closing, said he was not connected with any large charitable general hospital. His observations had been drawn from consultations with general practitioners, who had sent to him patients from what might be called the self-supporting class. Such practitioners were not so well equipped, perhaps, for making the studies and early diagnoses as the obstetric experts here tonight. It was to draw the attention

of the general practitioner to the gravity of t
of pregnancy, as seen by the ophthalmologist,
survey of what has been reported as happen
nancy. He himself had not seen a case of ke
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which occur, perhaps, without vomiting. She
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tholmologist later to have glasses fitted; then
in the optic nerve and choroid are discover
cases who should have had early attention.

A Brief Report of Twenty-nine Cases of Mongol Special Reference to the Etiology From the the Clinical History, With Presentation of

Dr. Mary E. Pogue stated that some autho
three to five per cent, and others as high as
the mentally deficient as belonging to this clas
ive mental development is the outcome of a br
cally inferior. It had never been her privil
Mongolian whose mental age tested, by the B
Tests, above the eighth or ninth year. As a
cheerful and pleasant to live with. They ar
tive, and each author who writes upon this su
their musical tendency. They have charact
movements, and Dr. Pogue believed Bianchi is
ing us to think of such symptoms in relatio
Mongolians are born optimists; they have fu
and characteristics. The effective element o
is above the content.

She reviewed the physical characteristics
and in discussing the rarity of Mongolism in c
ish parentage, stated that it was interesting bu
significance.

Commenting upon the relation of syphilis to Mongolism, the author stated that she did not wish to be understood as not holding syphilis responsible, and alone responsible, for some cases of Mongolian idiocy. None of her patients gave a positive Wassermann reaction. If a specific infection is back of this, then the brunt of it may be borne by the endocrin glands. Chemical attractions may exist between a certain strain and the endocrin glands.

Dr. Pogue gave a brief review of the clinical history of four children with Mongolism, and stated that she thought Mongolism is much more frequent than has formerly been believed. She believed certain mental symptoms occurring in the pregnancy of one of the mothers was due to her harboring a Mongolian. One of her twenty-nine cases of Mongolism married and twice conceived. She carried the first child four or five months, and with the second came to term. The child was not a Mongolian.

As to glandular feeding, a circular letter was sent to a number of the foremost institutions in the country, asking their results. In not one instance did they speak of having received the slightest benefit from it. However, Dr. Pogue felt strongly that it is of some benefit. Glandular feeding increases the stature in many instances, alters the nutrition of the hair, and is of inestimable value in overcoming the digestive disturbances. She suggested that the extract of thymus gland be given almost at birth as a nutritional aid; after the third or fourth years, thyroid; and about the tenth or twelfth years, pineal gland.

Dr. Pogue likes to call this condition a psychosis, and feels that it is not a problem that we can hope for education to answer. It is a research problem in medicine. We have been at the educational side long enough to know its limitations and to frankly state them.

Our knowledge of the ductless glands is most imperfect, but enough light has dawned so that we now know that various ones of them are more active at different periods of life. If Mongolism is brought about by a pluriglandular insufficiency in a mother, whether or not the insufficiency of these glands was caused by some chronic infection, glandular feeding would probably help her.

Eye Signs and Symptoms of Mongolian Idiocy.

Dr. Casey A. Wood said that this report was based on examination of eleven cases, and it also furnishes a review of the recent literature.

Fifty per cent of Mongolian idiots show eye changes of various sorts, and these are mainly abnormal direction of the interpalpebral fissure, epicanthus, blepharitis, ectropion, squint, nystagmus, and cataract.

The relative position or direction of the interpalpebral fissure forms one of the general characters of this mental defect. The fissure on each side is directed upwards and outwards in nearly two-thirds of the cases, giving a decided "Chinese" appearance to the unfortunate patient.

Epicanthus is a very common congenital anomaly in Mongolian idiocy, and is found in about one-quarter of all the cases.

In three cases the epicanthic condition was well marked, and in one instance was associated with a marked bilateral congenital stenosis of the lacrimal duct—the socalled infantile dacryocystitis.

Blepharitis is generally of the dry marginal type, and is thought by some observers to be due to the uncleanly habits of a certain class of idiots, who frequently rub their eyes, but this has not been the writer's impression of its causation and perpetuation. The facial skin, as a whole, is often not normal, and the dermal covering of the lid may exhibit the same characters and serve as a basis for the blepharitis; or it is perpetuated by ectropion, and possibly by errors of refraction that are also frequently present.

The ectropion, together with the scaly blepharitis, is found in nearly half the cases of Mongolian idiocy. The former is very likely due to a superficial contraction of the palpebral skin, which is often rough, glazed and quite dry. In one case this condition of the lids was well shown, and gave rise to a good deal of trouble.

Squint, generally of the convergent variety, is quite frequently present, and may be regarded as one of the stigmata of Mongolian idiocy. It occurred in three of the writer's small series. There does not seem to be anything special about the form of the strabismus, and it is associated, as a rule, with the usual amount of hypermetropia.

Of refractive errors it may be added that an unusual degree of hypermetropia, generally associated with astigmatsim, is common in Mongoloids.

Nystagmus, of the lateral variety, occurred in two cases.

Cataract. By far the most characteristic and most interesting concomitant ocular change in this form of idiocy are, however, lenticular opacities. These occur so regularly that they may be regarded as a veritable stigma of Mongolian idiocy; and when there is doubt as to the form of the mental defect in early infancy, he believes the fundus should be carefully scanned for the punctate form of the anomaly, because it occurs in more than half the cases.

One of the peculiarities of this dotted cataract is that it is not easy to discover in infants a few months old. The dots at this period are so translucent that they cannot always be seen by transmitted light. Later, they probably increase in number and in opacity, so that their presence can readily be detected. They are always of incomplete form, and appear in the lens layers occupied by the changes in ordinary lamellar cataract. They do not spread to the periphery of the lens, but take the form of a small, definite, discrete dot. In about one-quarter of the cases there is also well marked posterior polar cataract.

In a few cases examined there were no vitreous, retinochoroidal or optic nerve changes, and the writer does not believe that alterations of this character belong to the ocular stigmata of Mongolian idiocy.

Discussion.—Dr. Archibald Church said the first thing that forced itself on the attention in the consideration of Mongolian idiots was their striking similarity. After seeing a few cases, it is almost impossible to mistake one for anything else. Vogt has said that parents coming to visit their children, if presented with half a dozen cases, are unable to recognize their own offspring. Whatever is the cause of Mongolian idiocy, it is uniform and definite, because the results are parallel.

Clinically they all have short, broad heads, a low bridge of the nose, and the nostrils are flaring. The tongue is rugose. The fontanelle almost always closes early, the stature is below par, and the condition of the bones is peculiar. In one extremity you may find the changes that suggest giantism next to a bone in which ossification is retarded. The hands are spade-shaped, and the terminal phalanges stubby, with short broad nails. The tendons and ligaments are always relaxed, and the fingers can be put back on the dorsal surface of the hand without producing any inconvenience. Cleft palate, extrophy of bladder, hernias, hypospadia, and cryptorchidism are common. These children are defective, unfinished products, the genital development is backward, and sexual differentiation incomplete. The case reported by Dr. Pogue, where a girl married and had children, is unusual.

They nearly all die before reaching middle age, and very often of tuberculosis, which means nothing as to causation. As to syphilis, Dr. Church had tested a number of cases serologically in recent years, and they had all been negative. X-ray pictures of two cases showed that the sella turcica was not enlarged, and there was no indication of any pituitary disease, nor disturbance of the pineal gland. Pineal gland feeding has been used to stimulate growth in these cases, at first with apparent advantage, but the latest view is that the pineal is not glandular and that it has no effect on stimulating growth, either in adolescence or infancy. Thyroid has also been tried in many cases without noticeable effect. Usually the skin is velvety or infantile, but has not the rubberoid condition found in myxedema. The mental condition is entirely different. These patients are bright and affectionate; they have powers of appreciation and pleasurable emotion; they enjoy the attention that is lavished upon them, and suffer if neglected. As to whether the sex glands are at fault or some of the other glands of internal secretion, is as yet undetermined, but probable.

Anatomically more defects of the heart are found than of any other orgran; persistent ductus arteriosus and lateral openings between the ventricles and auricles are common. Many of them are "blue babies." Their tissues are of low survival value, and do not resist infection well. The tendency to cataract is perhaps an expression of the same inherent defect.

Dr. Church believed this disease was not a race condition, or due to syphilis, or tuberculosis, or alcoholism on the part of the parents, and that when we know the cause of disease of the endocrin glands, we will know the cause of Mongolian idiocy.

Dr. Burton Chance asked if Dr. Pogue had noticed disease of the cornea in this class of patients, and he mentioned that he had seen within the year five or six such patients, none of whom had been in institutions. One boy had had a persistent keratitis, and also the inflammation of the lids of which Dr. Wood spoke. A girl has been under his observation for probably fifteen years; she was supposed to be nine years of age when she was first brought, and is now declared to be only fourteen, for nobody knows how old she is. She had had a definite keratitis, and the Wassermann reaction was positive. She did not do well under mercurial treatment; but when she was given thyroid, her general health improved, although she did not grow taller. Menstruation occurred at about the time she was believed to be fourteen; very scantily and irregularly, the patient sometimes going for a year without a period. He thought it strange that observers have found so few congenital structural defects in the eyes of the idiotic.

Dr. Casey A. Wood asked if Dr. Pogue had noticed that the Mongolian idiot was dirty in his habits—whether they were apt to rub dirt into the eyes or put their dirty fingers up in their eyes.

Dr. Pogue, in answer to Dr. Wood, said that Mongolians were not dirty in their habits, but cleanly; the condition of the eyelids being due to a defective development of the skin and its appendages. She had never had a case who rubbed his eyelids or eyebrows. In institutional practice they always had institutional keratitis, but in private practice she had never had it.

The average Binet age is between two and five years, and sex manifestations of any degree could not be expected. She agreed, with Dr. Church, that when we know more about the endocrin glands we will know more about this disease, but she doubted if one and the same condition could ever be held responsible for it. In one case she had had X-rayed there was an evident enlargement of the pineal gland, and in another there was an enlargement of the thymus.

Regular meeting, held May 21, 1917. Dr. Francis Lane in the chair.

Report of Four Cases of Ocular Tuberculosis Treated by Tuberculin.

Dr. Thomas Faith said that these cases were selected from amongst a number of cases of tuberculosis of the eye which had come under his care in the past ten years, and were chosen because of the fact that, in addition to the general interest attached to such cases, each teaches a lesson which should be remembered if we are to manage the treatment of this affection to the best advantage.

One case of sclerokeratitis, two of choroiditis, and one of optic neuritis or neuroretinitis.

The report of the following case will serve as an illustration of the other three: Mrs. A. M., aged twenty-three years, housewife, was seen first December 30, 1911. She was of a family of five children, three living; two sisters, older than the patient, died from some pulmonary trouble. Father living at the age of sixty-six years. Mother died when the patient was eight years old; cause not known. Two brothers, younger than the patient, are living and in apparently good health.

Personal History.—Has never been robust. Has had swellings in the neck since a small girl; has suffered from indigestion and intercostal neuralgia much of the time for several weeks; looks pale and is under weight. She had an attack of pain and inflammation in the left eye eight months ago, which was diagnosed iritis, and for which she was treated over a period of five or six weeks. She complains now of pain and inflammation in the right eye which has been present one week. This condition followed immediately after a severe attack of lumbago and sore throat. There was a typical anterior scleritis, with swelling and tenderness just beyond the upper margin of the cornea.

Atropin, dionin, and hot applications were ordered locally, and calomel and salicylate of soda internally. Urinalysis at this time was negative. The nose and throat were examined and evidence of the previous attack of tonsillitis could easily be seen. There were several enlarged glands in the posterior cervical region, and the glands of the internal jugular area were also much enlarged. There was no venereal history and a negative Wassermann was obtained in the next two days. The pupil dilated well under atropin, but the eye remained painful and tender, with only an occasional slight improvement for the two following weeks.

A thorough physical examination and a blood count shows nothing of any importance. It was then determined to remove the tonsils, as they were distinctly diseased. This was done on the 16th of January, 1912, using the Tyding's snare. There was a distinct improvement for the first week after the tonsillectomy, but by the tenth day after the operation the condition was as severe as before. For the next two weeks, in spite of the negative Wassermann, she was put upon inunctions of mercury and iodid of sodium, but instead of improving she continued to grow worse. After the tonsillectomy and during the time of her antiluetic treatment the temperature was recorded each time that she came to the office, and it was observed that the afternoon temperature was usually above normal. From the 12th to the 20th of February the patient was kept quiet at home, and the temperature recorded every three hours from waking until bed time. The result of this test was that the patient's temperature was found to range from 97° to 98° F. in the morning to 99.8° or even 100.2° in the evening. At this time the infiltration had extended well into the cornea, and the sclera was thickened, swollen and tender.

On February 20th, 0.5 milligram of O. T. was given, followed in eighteen hours by a sharp general and focal reaction. Temperature went to 101.6°. The eye became more inflamed and painful, and there was some soreness of the glands of the neck. Following this there was a gradual subsidence of the temperature and an improvement in the eye condition. After about twelve days, when the temperature had receded to and remained at the same average as before the test, treatment was begun with Mulford's T. R., No. 1. This was repeated at three-day intervals, gradually increasing the dose in the usual proportion and watching constantly for evidence of reaction which came with the fifth dose. He was obliged to rest a week and then increase the interval to five days; when the dose had been raised to 1/1,000 milligram, the interval was increased to seven-day periods and was so continued.

There were never any new nodules on the sclera after the fifth injection, and the temperature only went above 99° twice after the twelfth treatment. The eye began to clear rapidly after the sixth injection, and by the time the tenth was given there was not a trace of active inflammation remaining. This case was given in all twenty-two injections, and up to September, 1914, had never had a recurrence. Her adenitis disappeared and her general health was improved in every way.

After citing reports in detail of the other three cases, Dr. Faith stated that each teaches an important and valuable lesson. Case 1 shows that a tubercular process may be engrafted upon or added to some other even acute condition which seems to prepare the tissues for the localization of the tubercular process. Case 2 shows that even in the absence of any definite physical finding in the chest, the diagnostic dose should always be a small one, in order to prevent not only local but possibly general disaster to the patient. This case also shows that an injury may be the determining factor in the localization of a tubercular process. All four of these cases teach one not to rely too much upon physical examination of the chest for corroborative evidence in making the diagnosis. Case 4 demonstrates that it is sometimes necessary to make a number of diagnostic tuberculin tests before making up one's mind as to the presence or absence of tuberculosis as the causative factor in the case. Two of the cases likewise show that one should not be tempted to make the injections at too short intervals or to increase the size of the dose too rapidly. It is well to give the smallest possible dose which will produce a result without a reaction.

Discussion.—Dr. George F. Suker stated that Case 2 was a very illustrative one, showing that the diagnostic dose of tuberculin was too large and the end result, therefore, disastrous. Tuberculin diagnostically used was a double edged sword, and one could, without these large doses of tuberculin, diagnosticate tuberculosis. An X-ray should be taken, for one could have lymphatic nodes in the presternal region. Also have a temperature chart, for whether the tuberculosis be local in the eye, or be limited to the lung tissue, the signs, symptoms and the general course of temperature must be and often are alike. It made no difference whether a patient had tuberculosis of the big toe or eye, that patient was bound to run a temperature, and if one took the temperature at regular short intervals he would find it was elevated; hence it was advisable to guard against the use of excessively large doses of tuberculin for diagnostic purposes, as they were disastrous to the eye. The smallest possible dose of tuberculin that gives a minimum reaction is more than sufficient to make a diagnosis. The therapeutic dose should never give any reaction or be repeated too frequently; long intervals between injections is better. Furthermore, the general regimen of the patient should be properly taken care of. Tuberculosis of the eye should be treated upon the principles underlying the treatment of a tuberculosis of the lung. Tuberculosis of the posterior globe is usually chronic, and not acute.

As to tuberculosis of the choroid, it had been the speaker's observation, both personally and from the literature, that such lesions of the choroid should be gingerly handled as regards the injection of tuberculin for therapeutic purposes, rather more so than tuberculosis of the iris or of the ciliary body and processes. All intraocular tubercular lesions are very apt to give some systemic symptoms.

Dr. Richard J. Tivnen said there was no class of cases that caused the ophthalmologist more distress and taxed his patience more than these tubercular subjects. It required an infinite amount of perseverance and an infinite amount of assurance and stimulus on the part of the patient to assure him that he should continue and fight it out. He endorsed the paper because the essayist had outlined a definite procedure for handling these cases, and had pointed out the great danger from the use of tuberculin when given in too large doses. Anyone who had used tuberculin, quickly found out it was one of the most dangerous agents at the command of the ophthalmologist, particularly so from two standpoints: First, to determine precisely the individual dose that is suitable for the particular patient, and the second was how frequently the dose should be administered. Someone had said there was no such thing as dosage, and this was particularly true of tuberculin.

Another point emphasized was that there was no class where teamwork was more essential than in these cases of ocular tuberculosis—teamwork with the internist and with the nose man, and so on.

These patients should, if possible, be kept under observation in a hospital. While Dr. Faith had some of his cases under observation for six months, it was difficult to keep these patients for that length of time. When one undertook to treat a case of this nature, he should follow a definite procedure; and if this was done, both from the diagnostic and therapeutic side, great good could be accomplished.

Dr. Willis O. Nance stated that the results from the use of tuberculin in his experience had been rather varied. In some cases he had been able to get almost magical results, and in other instances the results had been disappointing.

Since the publication of Verhoef's monograph several years ago on the etiology of scleritis, in which attention was called to the fact that the majority of these cases were due to tuberculosis, the speaker had followed out treatment along these lines in all cases, except where he believed there was some other etiologic factor. He called attention to a case he had under observation at the present time. A woman had had recurrent attacks of scleritis for more than two years, and had been treated by a number of ophthalmologists of Chicago. When she came under his observation last fall he had a tuberculin test made, and a very thorough physical examination made, including the microscopic and clinical examinations. The conclusion was that the patient was suffering from ocular tuberculosis. She responded promptly to the tuberculin test. The Wassermann test was negative. She had had three Wassermanns made at different times. Dr. Nance treated her with tuberculin T. R., and about the tenth or twelfth injection she developed a very severe focal reaction. In fact, it alarmed her, she stating that the eye was in a worse condition than it had been during the two years she had been suffering from the disease. There was absolutely no benefit whatever from any of the injections. The result was so alarming that he decided he would allow the patient to rest for a while as far as injections were concerned, and he substituted the iodid of potassium. He began with thirty grains a day, and rapidly increased it until it reached about sixty grains, three times a day. The eye began to clear up and the dose was finally increased to 270 grains a day, and very soon the eye was perfectly clear. The amount was then reduced to 150 grains a day, which she is taking at the present time, with a very satisfactory result. This case showed that the Wasserman test was not a positive diagnostic test, neither was the tuberculin test always positive. This patient showed no symptoms of syphilis in any form. The family history was excellent, yet this case of scleritis yielded beautifully to large doses of iodid of potassium.

Total Symblepharon.

Dr. J. A. Pratt, of Aurora, said that in total symblepharon, as well as in any symblepharon, the aim of the surgeon should be to restore the condition to normal with the least possible operative procedure. To Hotz, Wilder, Weeks and Woodruff we owe the great advance in operating for this condition. The paraffin coated block tin plates, and Weeks' method of restoration of the inferior cul-de-sac by anchorage to the periosteum of the rim of the orbit, has made the transplanting of the Thiersch grafts possible. In previous operations his difficulty was the placing of the grafts, and he presented a method, while possibly not new, he was unable to find it described. It was the suturing of the Thiersch grafts to the block tin plate, which avoided all difficulty in the handling of the grafts, and greatly simplified the operation.

The case which he reported was operated upon by this method. About six months previous to his seeing the patient he was burned by hot metal. The eye was destroyed as well as parts of the edges of both the upper and lower lids. The eye was eviscerated by the attending physician and when healed there was total symblepharon with a fissure where the palpebral opening existed. The mucous membrane was entirely destroyed.

With such an extensive surface the question of manipulating the large grafts necessary to cover the wound brought forward the idea to suture the grafts to the plate. A plate of block tin a little larger than a normal conjunctival sac and curved to fit the same was made. A double row of holes was bored through the center in the longer diameter, so it would only be necessary to cut a graft large enough to cover one-half of the plate, and each graft could be sutured on separately. Commercial paraffin was used to coat the plate, care being taken to clean each hole of the paraffin.

After the grafts were cut from the arm they were sutured to the plate with the raw side out, and the sutures tied on the convex surface. The plate with the grafts attached was now placed in warm normal salt solution.

In preparing the socket the lids were first dissected free from the shrunken globe for about one-eighth of an inch, and an anchor suture passed through the globe, to be used to draw the stump in different directions while dissecting off the lids. The lid dissection was performed with a Beard lid knife, to the extreme limit of a normal superior cul-de-sac, and to the orbital edge inferiorly. After the dissection the orbital edge should be felt sharp and distinct. After the wound was dry, the plate with the grafts was slipped into place and allowed to remain free. Both eyes were now bandaged and the patient kept in bed. On the second day the bandage was removed from the operated side, and an instrument passed between the edges of the lids, and the secretion was removed. Thirty-five per cent argyrol was now instilled. He had prevented partial symblepharon in fresh burns in the eye by the instillation of thirty-five per cent argyrol after separating the raw surfaces. The coagulation and deposit kept the surfaces from growing together. This line of treatment was continued for six days, at which time the sutures used to hold the grafts to the plate were removed, leaving the plate free and the grafts adherent to the new socket. The bandage was now removed from the well eye, and the patient allowed to go home and report to the office for treatment.

The holes in the plate allowed the cavity to be flushed. At the end of twenty days the plate was removed, small granulation points were nipped off, and a smaller prothesis of block tin was introduced. The cavity continued to shrink, and at the time the case was presented to the society, October 16, 1916, the prothesis worn was about one-half the size of the original operative prothesis, and the cavity was entirely lined by epithelium. The case was presented for advice in reference to the use of foreskin in deepening the shrunken superior and inferior cul-de-sac. Dr. Suker at that time advised against the use of foreskin because of its future shrinkage, but later, at the academy meeting in Memphis, recommended its use for these cases.

In the second operation, to deepen the superior and inferior fornix, half-moon plates were used with a row of holes at the palpebral edge through which to suture the grafts, while in the edge of the plates opposite the sutures holes were placed two holes for anchor sutures.

The Weeks operation for the restoration of the inferior cul-de-sac was performed. In operating on the superior cul-de-sac the anchor sutures were brought out at the superior edge of the orbit, and tied over a roll of gauze. The technic of placing the grafts was the same as in the first operation, except that grafts were sutured to the enlarged external and internal canthi. The results which were seen in the picture submitted were obtained by these two operations.

The author considered there were two mistakes in the first operation: first, the grafts were made a little too small, and second, the external and internal canthi should have been covered by suturing grafts to the same. He felt confident that if these two mistakes had not been made, the socket would have been completely restored by the first operation.

Discussion.—Dr. George F. Suker said the use of foreskin was not very applicable when one wanted to cover a large surface, as it had a tendency to contract too rapidly, particularly where excessive cicatricial tissue had already been formed, and where one had to cut cicatricial tissue to get a space to be filled in with a graft. He had discarded the use of foreskin for grafting, with the exception, perhaps, in cases of resection of the tarsus for trachoma for the restoration of the retrotarsal fold.

He had under observation a patient who had a complete symblepharon of the upper and lower lids, and an intact eyeball, in which he succeeded in freeing the upper and lower lids, and today this man was able to recognize daylight from darkness and recognize moving objects. In this particular case he used foreskin seven or eight times, and he was still trying to get a suitable graft to further enlarge the upper cul-de-sac.

As to fixing the graft to the plate, he stated that the late Dr. Hotz employed that method constantly before he inserted the graft. The secret of successful grafting is that the graft should be fixed to the plate as well as to the receiving area by means of sutures. Second, the graft should be three or four or even six times larger than the area to be filled in. He had seen transplanted grafts half the size of his hand or even larger shrivel down to almost nothing. It is the fixing of the graft to the plate and edges of receiving area that prevents shrinking in a goodly measure.

Dr. Willis O. Nance said the case reported by Dr. Pratt was an exceedingly interesting one, and the result very good. It was an operation that was devised, he thought, by one of the members of the society, Dr. Harry Woodruff, about ten years ago. Dr. Woodruff did considerable work along this line at the Eye and Ear Infirmary at the time, including attaching of the graft to the plate. The speaker did the operation a number of times, and remembered very well an experience he had at first in getting the graft properly sutured to the plate. It was not an easy thing always to do this. He cautioned the members of the society against using this method in cases of partial symblepharon in which the eyeball remained in the orbit. He had seen a cornea become necrotic as the probable result of the insertion of a metal plate in the eye.

Dr. Richard J. Tivnen, in speaking of the method of anchoring the graft to a tin plate, said he saw Dr. Woodruff employ this method at the Eye and Ear Infirmary. In a recent case he had the same difficulty that Dr. Pratt had from adhesions forming about the inner canthus, and he was glad to know the use of argyrol prevented the formation of these adhesions. Shrinkage could be prevented by inserting a block tin plate and keeping it there for a certain length of time, so that things became adjusted more or less permanently.

It was difficult to get a graft large enough; it should be very much larger than the area one was going to cover. Proper anchorage of the graft was the vital thing. Sometimes the speaker had taken the graft for the upper cul-de-sac and inserted a suture in the apex or bottom, and in addition put in a block tin plate. A difficulty had been in getting the surfaces apart at the inner and external canthi.

Dr. Thomas Faith thought the method described by Dr. Pratt of anchoring the graft was a little different from that usually employed. If he understood him rightly, he anchored not only the graft, but the plate up in the cul-de-sac. Most operators attached them to the edge of the lid, keeping them in that position, and allowed the plate to hold itself in the cul-de-sac by being fastened to the lid. He had seen a number of cases in which the plate had been gradually pushed out before one was ready to take it out. The scheme of anchoring the graft to the plate and all would obviate that.

Dr. Francis Lane said a point was brought out in the preparation of the Thiersch graft that the vascularized tips of the papillæ of the skin should be left intact when laid on a dry surface. With slight oozing of serum, the capillaries very rapidly grew from the prepared surface into the vascularized tips, and minimized the shrinking process which took place after the graft was put in place.

Glaucoma and Autointoxication.

Dr. Clark W. Hawley presented for consideration a report of four cases of glaucoma that had been under his care for the past year. In these cases his results had been so superior to any that he had been able to get before, he felt justified in bringing them to the attention of the society.

A year ago he received a call to see a patient in a neighboring village who was said to be suffering from iritis. The patient was a lady, who, at the breakfast table, found that she could not recognize her friends about her. He found her in bed with all the symptoms of acute glaucoma. She had nausea, loss of vision in the left eye, increased tension, and a dilated pupil. She had diagnosed her own case as one of iritis, as the symptoms were similar to an attack she had a year or so before. A Chicago oculist advised the use of atropin. Patient had lost the right eye some time before, as an iridectomy had been done, but without result favorable to vision. He at once prescribed for her, and in getting a more complete history of the case he was in some way impressed with the idea that she was suffering from an extreme case of autointoxication, suspecting the source to be the lower bowel. He gave his usual instructions to be followed in such cases, not waiting for the urinal test, which was carried out later on and confirmed his suspicions fully. Patient improved so rapidly, much more so than any case he had had under myotics, that he was surprised, and wondered how much the autoinfection had to do with it. As soon as the patient was able to come to his office he found vision 20/80 in this eye, a very little in the other or lost eye. In a very short time vision was 20/40 and came on rapidly to 20/20, and the near vision also became normal. The patient, after a year of treatment, considered herself cured. The treatment for the autointoxication was still continued, as it was impossible to cure a case of this kind of infection in a short time. The bowel would take on a normal condition only after months on a very restricted diet and bowel flushings. Not enough time, he thought, had elapsed to make a positive statement, but of this fact he was sure, that in his twenty-five years of eye work he had not had such results as in this and the other three cases, so that he was justified in at least thinking very seriously of autointoxication as having something to do with the cause of glaucoma. He was led to this idea by his experience with a number of cases of iridocyclitis and chronic cyclitis, which he published two or three years ago.

Lastly, he stated that he absolutely would refuse to look after any patient who refused to follow his instructions absolutely, and it was only under this strict regimen that results could be accomplished.

Discussion.—Dr. J. A. Pratt, Aurora, reported a case due to infection outside of the bowel, showing that a patient may have glaucoma caused by infection. This patient was a man who lost one eye about sixteen years ago, and eight years thereafter he began to have attacks of iritis in the other eye, a number of months apart. These attacks gradually became worse until he developed iridocyclitis, and later, after having had them for two or three years, off and on, he had an attack of glaucoma. Iridectomy was performed. Before this the patient had his tonsils removed. The Wassermann and other tests were made, with negative results. His bowels were looked after. He was not allowed to eat meat; he was not allowed to smoke; he stopped drinking, and each one of the attacks cleared up under Turkish baths and large doses of sodium salicylates, with eserin. The attacks continued after the iridectomy. Patient went for nearly a year without an attack, then he had two or three slight attacks. His teeth were X-rayed, and trouble was found with a left central incisor, although it was the right eye that was affected. This tooth was extracted when he had an acute glaucomatous condition, which was controlled by eserin, and it was found that half of the root of this tooth had been absorbed. As soon as the tooth was extracted the patient was taken off of eserin. The second day thereafter his symptoms disappeared, and for the last six months he had not had any trouble. It looked to the speaker as if the trouble in this case originated from an abscess in the central incisor.

Dr. von der Heydt said that while hygienic measures were essential in the class of cases reported by Dr. Hawley, and a vegetarian diet could be advised, as advocated, he thought it was a therapeutic error to lay so much stress on these things and to exclude myotics in inflammatory glaucoma, as had been done in one of the cases reported. He thought myotics were still the remedies par excellence.

Dr. Willis O. Nance said there was no doubt but that autointoxication figured to quite an extent in the causation of many eye diseases. He remembered that several years ago, when de Schweinitz first called attention to autointoxication in the causation of cases of iritis, he made it a point to go into the etiologic factors of many eye diseases in relation to this condition, but was disappointed in the results. Recently, if he was not mistaken, de Schweinitz had backed down somewhat from his, at first, very enthusiastic idea of autointoxication as the cause of many eye diseases. He did not think Dr. Hawley would treat cases of acute glaucoma simply along the line of flushing out the bowel and the abolition of a meat diet. He certainly would do iridectomy just the same as in cases of acute glaucoma, because a delay of twenty-four hours in some of these cases meant destruction of the eyesight; yet the idea advocated was a good one on general principles. Most of the cases of glaucoma occurred in middle aged or elderly people, and the abstinence from a meat diet, with bowel flushings on general principles, was excellent treatment, but he did not believe the essayist would rely on this alone.

Dr. Thomas Faith stated that evidence was gradually accumulating that some form of chronic intoxication was responsible for glaucoma. He knew of two instances in which glaucoma had been relieved by getting rid of a focal infection.

Dr. Hawley, in closing, said the object of his paper was not to bring out especially the fact that glaucoma was due entirely to infection from the bowel. That was only one source of infection, but that a large proportion of cases of glaucoma were due to infection somewhere. The speaker would not rely solely on treating these cases of glaucoma by bowel flushings. Myotics and other measures of treatment should be carried out as adjuncts. He ventured the assertion that ninety per cent of practitioners did not know how to treat autotoxication. He knew of case after case where practitioners had absolutely failed to treat autointoxication successfully, simply because they did not know how, and because they did not insist on patients doing as they ought to do.

Dr. Harry S. Gradle asked Dr. Hawley whether he had eliminated the possibility of a cyclitis precipitate on the posterior cornea, to which Dr. Hawley replied that he had not.

At the request of Dr. Nance, Dr. Hawley then detailed the instructions he gave these patients in addition to the bowel flushings.

A Case of Chronic Conjunctivitis (Plasma Cellularis).

Dr. Harry S. Gradle, in reporting this case for Dr. Bailey, stated that the patient was seen last year both by Dr. Suker and himself, and the affection pronounced plasma cellularis. A small piece of tissue was removed, a section made and examined. Histologically, the case was undoubtedly an instance of clinically atypical vernal catarrh. A blood count taken today showed eosinophilia slightly over five per cent. A smear taken from the conjunctival secretions showed no organisms, but an enormous number of eosinophiles in the secretion. If this had been done previously, they would not have thought it was a case of plasma cellularis.

In the conjunctiva, plasma cellularis was found. The blood picture showed leucocytosis. There might or might not be some plasma and mast cells, but there was a marked increase in the small mononuclear leucocytes, up to as high as forty per cent.

The first of these cases was reported by Pascheff in 1908. Since then nine others had appeared in the literature. By some authors these cases of chronic conjunctivitis, or plasma cellularis, were regarded as a local manifestation of systemic infection, because in some of the cases reported there was febrile disturbance accompanying it; whereas, other authors regarded the disease as a local affair. The speaker was inclined to believe it was a local disease affecting the conjunctiva and its hematopoietic function. Treatment was not of much value. One case is reported by Elschnig as having been cured by the total excision of conjunctiva. In fact, in this case the local blood picture returned to normal, and the cicatricial or scar tissue that replaced the conjunctiva was no longer of the inflammatory type previously seen. According to the last reports of the patient he saw last year, the condition was unchanged. The boy had had the disease for four years before the speaker saw him, and probably it would continue for some little time. Dr. Lane, who made the histologic examination, could tell the society more about the microscopic picture.

Discussion.—Dr. Francis Lane said he reported the microscopic findings in Dr. Gradle's case eighteen months ago, but the findings in this case were different. The epithelium showed in places slight keratosis, such as one would find on the papillæ of the tarsal conjunctiva. The case showed mucoid degeneration at the border of the knobs. One thing noticed in particular was an overdevelopment of the connective tissue of the substantia propria. He could not make out any hyalin degeneration, because all connective tissue took practically the same uniform eosin stain. There were a few plasma cells, but no more than in the chronic forms of conjunctivitis.

One thing of interest about both of these cases was that it brought up the point of origin of the plasma cells. No cells in the conjunctiva had been discussed more than the plasma cells. But one investigator expressed the opinion that they were often of connective tissue origin. Later investigators, however, were of the opinion that they probably originated from the endothelial cells, such as the small or large round cell. There was very little proliferation or accumulation of small round cells of inflammation. The particular finding was an overdevelopment of connective tissue of the subepithelial structure. Many eosinophiles were found in the tissue itself. This was the first thing he noticed in particular.

Tension in Normal Eyes Before and After Tonsillectomy.

Dr. A. M. Carr stated that these observations on normal eye tension before and after tonsillectomy have been recorded in order to establish the effect that the hemorrhage, anesthesia, and shock, which accompanied that operation, as well as the removal of a focus of infection, have upon normal intraocular tension.

In a number of cases of iritis with secondary glaucoma observed at the Cook County Hospital, it was noted that accompanying the improvement of the iritis, following tonsillectomy there was a marked lowering of intraocular tension. This decrease in tension occurred within twenty-four hours after the removal of the tonsils and was permanent. There was satisfactory evidence to show that the reduction of tension was due to the improvement of the iritis dependent upon the removal of the tonsillar focus of infection, as the tension remained unchanged in the eyes in which there was no iritis; nevertheless, it was thought advisable to study the effect of the above factors in normal eyes.

The material consisted of one hundred case of tonsillectomy in which there was no history of eye trouble. None but very controllable patients were used. Their ages ranged from fourteen to sixty-seven years. Pus could be expressed from the tonsil in practically every case. About two-thirds of the cases were operated under local anesthesia, and the remainder with ether.

The Schiötz tonometer was used throughout. and the eyes were anesthetized with holocain. The tension was taken first a few hours before the operation and then twenty-four hours after the operation.

No variation greater than three millimeters was noted in ninety-five per cent of the cases. This degree of variation was of no significance, as all observers agreed that it was within the range of normal error, and should be properly ascribed to the limitations of present day tonometry. In no case was there a variation of five millimeters in the reading before and after the tonsillectomy.

Two cases had secondary hemorrhage with considerable degree of exsanguination. No difference was noted between the local and general anesthetic cases.

The average tension of the one hundred cases was seventeen and one-fourth millimeters; the lowest tension was ten millimeters; the highest tension, twenty-five millimeters.

He therefore felt justified in concluding that in this series of cases tonsillectomy, even when accompanied with considerable hemorrhage, had no effect upon normal intraocular tension.

MAJOR H. WORTHINGTON,
Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting held March 24, 1917. Dr. A. C. Magruder presiding.

Paralysis of the External Rectus.

Dr. Edward Jackson presented a man, aged fifty-one years, who had been struck low on the forehead by a fragment from a bursting wheel, one year before. There was a fracture of the bridge and septum of the nose, with extravasation of blood in the region of the lids, followed by slight exophthalmos of the right eye. He had fever and was semiconscious for two or three weeks. There was rigidity of the neck and progressive emaciation, with signs of a low grade meningitis.

He now shows a convergence of the right eye of sixty centrads, with inability to bring it to within fifteen or twenty degrees of the median line. The optic discs are clear, but pale and slightly cupped. The retinal vessels are rather small, especially in the right eye. Otherwise the fundus is normal. Vision is one in each eye. Diplopia requires the constant covering of the right eye. The use of slips from the superior and inferior tendons to attach to the tendon of the external rectus, was suggested; although most cases heretofore subjected to this operation had no capacity for annoying diplopia, and therefore the operation was probably more successful in such cases than in patients with a capacity for diplopia.

Discussion.—Dr. E. R. Neeper said he would not expect results after an operation upon this patient. The eye may be technically straight, and the operator may have a technically correct operation, but the patient would have diplopia. He would not operate. He would compel the use of the right eye by covering the left from time to time, or by some other means.

Dr. H. M. Thompson said he would not operate this case. In two of his own cases he gave a high plus sphere of eight or ten diopters, to be worn before the paralyzed eye, in order that the patient might be comfortable and avoid diplopia without having the paralyzed eye bandaged. This made both patients very comfortable. One of these cases recovered completely the use of the paralyzed muscle, although he had a negative blood Wassermann. The etiology was never determined, as numerous tests, laboratory examinations, etc., failed to reveal the cause.

Dr. Edward Jackson said he believed the only operation which would be of any avail in this case is to utilize part of the tendon of the superior and inferior rectus, but this is best in congenital cases at least. He had had this patient wear a patch over the right eye to avoid diplopia. At other times he had him wear it over the left eye, in order that he might use his right eye part of the time. If he operates this case it will not be until after he has watched it for three or four months.

Glaucoma Simplex.

Dr. E. T. Boyd presented Mr. W. H. W., aged sixty-eight years. Occupation, machinist's helper, with work at the nut machine. This patient was first examined April 1, 1916, at which time the left eye was blind. The tension was greatly elevated and the disc markedly excavated. The right eye showed a clear cornea with shallow anterior chamber, and moderately dilated and inactive pupil. The tension was forty-three millimeters, the fields concentrically contracted, with a central vision of 20/50.

Eserin was immediately prescribed. The patient used this for one week and returned. This time the fields were somewhat enlarged, and the tension was reduced to thirty-five millimeters. Central vision had improved to 20/30. He then explained to the patient the absolute necessity of using the medicine regularly, and continuing its use even though he should get an idea that it was doing him no good. He explained to the patient that his eye disease was serious, and that he might have to use eserin for years.

The patient called again in a week, with little or no change in his condition. The former advice, concerning the use of eserin, etc., was repeated, and an endeavor made to impress upon the patient the seriousness of his condition.

The patient disappeared and was not seen again until the present month. Recently the fields were so much reduced that he possessed nothing but central vision, which was 20/70. The tension was forty-five millimeters. The patient said that he had not been using the medicine for some months, as he did not believe it had done him any good. Eserin was again prescribed, and the patient was seen today with a tension of thirty-three millimeetrs.

Dr. Boyd asked if it would be advisable to operate this case, with the hope of conserving the little vision that he now has, and, if so, should trephining or iridectomy be performed. He believed that a successful trephining in this case would cause him to retain some vision longer than he would otherwise do, but that blindness will be the final result. He furthermore stated this patient is of such a perverse nature that, should the eye be operated and he go blind later, he would immediately attribute his blindness to the fact of his having been operated upon.

Glaucoma Simplex in a Myope With Unusually Low Blood Pressure.

Dr. H. M. Thompson presented Mr. S., sixty-three years old. Occupation, sheepman. First came for change of glasses February 19, 1914. Had worn a — 1.50 sphere both eyes for fifteen years; snow blind on two occasions; otherwise his eyes had never given him any disturbance. General health of patient was usually excellent, save occasional "sore throats and rheumatism."

Examination.—Partial ptosis of left lid (congenital), conjunctivitis both eyes, corneæ clear; anterior chamber, normal depth, irides good color; pupils three millimeters, react normally. Ophthalmoscopically: Discs and retina "fluffy," having an appearance of a mild neuritis. This finding caused me to institute a more careful examination. Vessels normal in caliber. Tension by palpation normal. Fields for form and color apparently normal. Urine, blood count and Wassermann negative. Physical examination revealed chronic cardiac dilatation; pulse, 80. Blood pressure: Systolic, 95; diastolic, 70.

Refraction.—Right eye, — 1.00 sph. ○ — 0.75 cyl. ax. 105°; left eye, — 1.00 sph. ○ — 0.75 cyl. ax. 75°. Vision both eyes, 20/20. General treatment advised.

December 4, 1914, patient returned, complaining of light causing pain. Vision, with correction: Right eye, 20/30; left eye, 20/20. Ophthalmoscope showed whitening and slight cupping of right disc; left, reddened as if slight neuritis. Tension: Gradle-Schiötz, right, twenty-eight millimeters; left twenty-five millimeters. Fields: Both slight contraction for form and color. No change in the refraction. Treatment (local): Eserin, pilocarpin and dionin to be used daily. Noviol glasses for light irritation.

Patient returned again in May and December, 1916, with no apparent change in vision. Fields more contracted in right eye, and cupping more marked in right and evident in left. May, 1916, vision right eye, 20/40; left eye, 20/30. Tonometer: Right, thirty-five millimeters; left, twenty-eight millimeters. Blood pressure: Systolic, 108; diastolic, 85.

Patient was not seen again until February 26, 1917. In the meantime he saw an old friend, a physician, who told him he did not have any such thing as glaucoma, and there was no eye trouble present. I believe this led him to neglect his treatment. Vision: Right eye, light perception; left eye, 20/40 partly with glasses. Tension: Right eye, 28; left eye, 20. Field in left eye decreased to nasal side. General physical examination: Myocardial degeneration. Blood pressure: Systolic, 96; diastolic, 70. Microscopic examination of tonsillar pus showed diplococci and short chain streptococci. Tonsils removed under local anesthesia.

March 22, 1917, patient returned, with evidence of an acute exacerbation in right eye.

DISCUSSION OF THE TWO CASES OF GLAUCOMA SIMPLEX.

Dr. Edward Jackson says he has watched a case of glaucoma simplex for ten years. He has this patient use pilocarpin. The tension has never been above thirty millimeters. The arterial tension ranges from one hundred and ten to one hundred and twenty. The patient's age is over ninety years. The patient stopped pilocarpin on one ocacsion of his own free will and accord and lost vision. He has never lost vision while using the pilocarpin, however. If Dr. Jackson operated, he would trephine and do an iridectomy at the same time, in both Dr. Boyd's case and Dr. Thompson's.

Dr. J. M. Shields mentioned a case with infection after a trephining operation. He is not in favor of the operation, because has seen this one bad result.

Dr. W. H. Crisp thinks he sees a tendency to criticise the trephining operation, and to do an iridectomy first. If necessary, a trephining operation may be done later.

Dr. Wm. C. Bane mentioned a case he saw in 1901, in which he did an iridectomy. Infection followed and the eye had to be enucleated. Later glaucoma developed in the other eye, and he did not operate. He has this patient use pilocarpin faithfully, as this holds the vision where it was when glaucoma first appeared in this eye. He saw this patient today, and she is maintaining her vision. He mentioned another similar case in which the patient believes the eye has been cured (?) by Christian Science.

Dr. C. E. Walker said the patient may lose central vision, whether we operate or whether we do not. The eserin may be sufficient. He is in favor of iridectomy in most of these cases. He mentioned a case of his own who refused operation. She returned later with one blind eye. He gave her eserin for the good eye. Later he operated upon the remaining eye; this was seventeen years ago, and she has good vision today. He believes an operation is favorable for acute attacks. He mentioned another case to prove his point that cases of acute glaucoma should be operated upon, and he also believes that the chronic cases should not be operated. He would do an iridectomy in Dr. Thompson's case.

Dr. Wm. C. Finnoff thinks one reason for infection after corneal trephining is that most ophthalmologists, the world over, do not have as good asepsis as the general surgeon. He marvels that there are not more infections than there are.

Dr. Boyd thinks proper disinfection of an eye is impossible. He will not operate his case, and he would not operate Dr. Thompson's case.

Dr. H. M. Thompson said he is opposed to operation of his own case, and will use either eserin or pilocarpin.

Dr. E. T. Boyd believes in operating all chronic cases of inflammatory glaucoma.

Neuroretinitis Probably Due to Accessory Sinus Disease.

Dr. H. R. Stilwill presented Master Melvin J., aged eleven years; Swedish. Measles six years ago; chicken pox three years ago; scarlet fever two years ago, with feet swollen at time of convalescence so that he could not walk for two weeks. Was run over by a bicycle last June and received a slight injury to his head; no cuts or bruises at the time, and no physician called; otherwise, he has always been healthy. Seven other children in the family, six younger and one older, all healthy. Mother died of tuberculosis last December, after having the disease for eight years.

Father first noticed last August that the left eye was more prominent than the right, and that it is gradually protruding more. With the Bane instrument there is five and one-half millimeters of proptosis. There is limited movement up and out, and a tendency to turn down and out; otherwise, movements are good. Diplopia when looking far to the left; bulbar conjunctiva clear; cornea and iris normal; pupils equal; no increased tension or bulbar tenderness. Says he has had some pain through the eyeball at times. Vision, right eye, 4/3, and left eye, 4/4; field not taken. Wassermann test negative; von Pirquet slightly positive; urine negative and physical examination negative; nose and throat negative. An X-ray reveals "an increased area of shadow in the posterior portion of left orbit." Fundus examination: Redness and cloudiness of the papilla, with obscurations of its margins; elevation about one diopter; arteries slightly smaller; veins somewhat tortuous; and no retinal hemorrhages. Left eye, negative.

Discussion.—Dr. W. H. Crisp inquired about the amount of proptosis of the left eye.

Dr. Stilwill answered it was five and one-half millimeters more prominent than the right.

Dr. H. M. Thompson feels very strongly that there is an abscess back of the left eye in this boy. He would evacuate the abscess.

Dr. Wm. C. Bane saw this case recently. He would do an exploratory operation and relieve the pressure by resecting the external rectus and turning the eye in, as he did in his own case recently. The eye is easily turned forward by resecting the external rectus.

Dr. A. C. Magruder referred to a case which he saw recently in New York. The pus was from the frontal sinus. There was an exploratory operation performed and the pus was evacuated from the orbit. Two days later the frontal sinus was operated upon.

Dr. Edward Jackson said the proptosis came in this boy first, and that he has good vision. The neuritis followed the proptosis. A tumor of the optic nerve produces blindness first and proptosis later. He believes, therefore, in this case that pus is present and not a tumor of the optic nerve, and that the pus should be evacuated. The sinuses should be examined by an X-ray. He would not operate upon the eye, as the vision is too good. He believes the involvement of the eye is entirely secondary to that of the orbit.

Dr. H. R. Stilwill said the sinuses have not been examined. A physical examination of the boy was made by Dr. G. H. Cattermole, in the pediatric clinic at the Medical Department of the University of Colorado. The temperature was 99.4° on one occasion. He did not advise any operation which would destroy the vision.

Dr. E. R. Neeper asked Dr. Magruder how the pus was located in the case which he had seen recently in New York City.

Dr. Magruder replied that the pus had gravitated back into the orbit from the frontal sinus. He thinks it would gravitate into Tenon's capsule in similar cases.

Dr. C. E. Walker said he saw an acute case operated upon by a rhinologist. The pus was above the upper lid and the palpebral fascia, with no pus in Tenon's capsule.

Dr. W. A. Sedwick asked why a canula or a trochar could not be used to advantage to evacuate the pus.

Dr. D. A. Strickland referred to a case in which he incised the upper lid to evacuate pus. The pus came from the frontal sinus. Later the frontal sinus was operated upon by Dr. Robert Levy, with remarkable success.

Dr. Edward Jackson said the chronic cases have a definite abscess cavity, but the acute cases have not.

Tuberculosis of the Retinal Vessels.

Dr. P. S. Lansdale, of Longmont, presented Mr. M. K. K., aged twenty-two years; occupation, farmer. Father died at age of fifty-seven, probably of paresis. Mother is living, aged sixty-five years, and in good health. There are four brothers and sisters, all living and well. All were born in Colorado.

Referred by an optician on February 26, 1917, on account of his being unable to fit the patient satisfactorily with glasses.

Patient complained of blurring of vision of left eye, and a feeling as of foreign body in the eye; duration, about one month. Vision, right eye, 20/15; left eye, 20/200. Refraction under homatropin showed an astigmatism of + .25 D. axis 90° in each eye. Fields, taken roughly, normal except upper nasal in left eye restricted. Urine tested for sugar and albumin, and negative. Blood pressure not increased. Retina of left eye shows a hemorrhagic retinitis.

Discussion.—Dr. F. R. Spencer suggested that this case seems very positively, so far as clinical evidence is concerned, to be one of tuberculosis of the retinal vessels, and he believes the patient should be given a thorough examination with this in view. It would probably be best to have the Wassermann test made also, in order that this may be excluded.

Dr. Edward Jackson thinks that the mass in the vitreous is suggestive of tuberculosis, too. He has a new case at the present time with hemorrhages into the macula. There is a focal reaction from tuberculin. The exudate radiates from the macula with a decided distortion of all the retinal images.

Meeting held April 21, 1917. Dr. W. A. Sedwick presiding.

Choroidal Tuberculosis and Atrophy.

Dr. Edward Jackson presented a young woman who, until nineteen years of age, had vision of 20/20 in her right eye, which suddenly diminished to 5/200. Ophthalmoscopic examination showed a central chorioretinitis, with a large area of edema of the adjoining retina. The ophthalmologists, under whose care she then was, "were unable to determine any cause for the condition," although careful clinical examination of her general condition was made, which did not, however, include tuberculin tests. She was given pilocarpin sweats, mercurial inunctions, and Donovan's solution.

The patch in the macula went on to choroidal atrophy with pigment deposit. She was first seen by Dr. Jackson eight months later. Vision in this eye was 4/45, with slight pallor of the outer quadrant of the optic disc, and choroidal atrophy two-thirds the size of the disc in the macula, with a small pigment patch at the fovea. The left eye was and has remained normal.

The condition continued practically unchanged for sixteen months, when the vision grew worse with a noticeable extension of the scotoma downwards. Ten days later swelling and gray deposits to the nasal side of the old patch of choroidal atrophy were seen. There was some pain and pericorneal hyperemia, with rise of tension to four on the Gradle instrument (presumed pressure, sixty millimeters). Shortly before this, swelling and soreness had developed in the metatarsophalangeal joint of the great toe. Tuberculin injections gave both general and focal reactions. Under tuberculin treatment the process subsided, the additional patch of choroid undergoing atrophy, the nasal larger portion of the lesion now seen in the macula. Vision in the right eye was reduced to 2/60 eccentric. There has been no evidence of fresh disease for more than four years. The patient was somewhat out of health when sent to Colorado, but has never given evidence of pulmonary tuberculosis.

The appearances presented supported the view of Stock and others, that a large part of cases of choroidal atrophy are due to tuberculosis.

Discussion.—Dr. Melville Black asked Dr. Jackson if the negative von Pirquet test would lead him to feel that the patient's eye is not tuberculous.

Dr. Edward Jackson mentioned a case with a tuberculous meningitis who gave a negative von Pirquet. He has a case now with a stellate figure in the macula, due to retinal tuberculosis. The patient has had bone, glandular and pulmonary tuberculosis. He gives a delayed focal reaction, but, of course, there is a general and local reaction present.

Dr. Black said he finds the internists depend on the von Pirquet test a great deal. If this is negative, it is depended on, and it should not be.

Dr. Edward Jackson believes we should not depend upon any one test too much. We must use judgment in our interpretation of any single test.

Dr. J. A. Patterson said a subcutaneous tuberculin test should be made in these cases, and he reported a case of a nurse with scleritis, keratitis and iritis due to tuberculosis.

She had had many relapses and gave a negative Wassermann, but was given potassium iodid and hydrargyrum by another oculist without very much improvement. She reacted to tuberculin, and has improved under its administration. She has slight pulmonary tuberculosis.

Dr. Wm. H. Crisp asked Dr. Edward Jackson if he has seen a case of monocular diplopia due to change at the macula.

Dr. Jackson said he had seen a case in which he believed the lesion was central.

Dr. W. A. Sedwick said his patient, a physician, has monocular diplopia due to astigmatism, but this is rather common.

Slight Remains of Pupillary Membrane.

Dr. Jackson exhibited a patient in whose right eye a minute brownish mass was seen near the upper temporal edge of the pupil. It was distinctly in advance of the pupillary margin in the anterior chamber, and apparently connected with the sphincter region of the corresponding part of the iris. About the center of the pupil on the anterior lens capsule was a fine horizontal line, about one millimeter long. These opacities were best seen with strong oblique illumination and magnification, but were also perceptible with a strong convex lens behind the ophthalmoscope mirror. The left eye presented no anomaly. These specks of tissue were probably very slight remains of the fetal pupillary membrane. This patient had been examined with the ophthalmoscope repeatedly in the last eight years, by Dr. Jackson and also in Philadelphia and Boston. But these appearances were only discovered within the last month, when searching for a foreign body in the cornea.

In another patient, a woman of thirty-eight years, the eye had been under observation for eight years, and examined ophthalmoscopically at least nine times, and three times under homatropin, before a thread of tissue was noticed stretching across the upper nasal periphery of the pupil in the left eye. Both ends were attached to the anterior surface of the iris over the sphincter, and where the pupil was dilated the thread was five millimeters long and drawn taut. With the pupil contracted it was entirely in front of the iris and difficult to see. These cases illustrate the readiness with which slight anomalies might be overlooked, and their probable much greater frequency than the usual statistics would indicate.

Discussion.—Dr. Wm. H. Crisp said it is quite common to see a white veil over the disc as remains of the hyaloid vessels —he found this in a case this morning—but less common to find the remains of a pupillary membrane.

Steel in Posterior Lens Capsule.

Dr. E. T. Boyd presented a man who had a piece of steel in the posterior lens capsule, following an injury on January 20th last. In thirty days a traumatic cataract was very much in evidence, with pain, redness, and iridocyclitis. This inflammation subsided under treatment, then he did a cataract operation the other day, and the steel came out with the lens attached. This piece of steel came from a drill chuck, and being in the posterior lens capsule should have been seen with the ophthalmoscope, but it was not. If he had seen the case soon enough, he would have removed the lens early, but he did not see the man until the cataract had developed. The man is twenty-nine years old. He opened the lens with a keratome and irrigated the lens space. The pupil was well dilated before this was done.

Discussion.—Dr. Wm. H. Crisp said he wondered what the literature would show regarding this case.

Dr. Edward Jackson said it is a recognized procedure to slip the lens out over the keratome. He feels that Boyd's case fared better than if he had seen the case early and operated early. The sticky cortex early in the disease would have complicated the operation. He would rely on the magnet rather than on the washing of the lens chamber. Risley reported his procedure at the last meeting of the American Medical Association.

Dr. Melville Black referred to his case presented before this society, in which the lens became cataractous very slowly.

Dr. E. T. Boyd favors the use of the small Hirschberg hand magnet for removal of steel in the vitreous.

Dr. Edward Jackson said the ideal place for the magnet is in the wound, and he seconded Boyd's remarks about the advisability of using a small hand magnet. The large magnet, he feels, is more dangerous than the small magnet. He thinks the lens masked the steel in the posterior lens capsule even quite early. He spoke of a case seen in consultation with the late Dr. E. W. Stevens, in which the steel was just back of the lens.

Dr. E. R. Neeper said he doubted the advisability of removing the lens too early. He is not in favor of a corneal operation. He makes a scleral incision and uses a long tip from the giant magnet.

Postoperative Result in a Case of Tumor of Optic Nerve.

Dr. Wm. C. Bane presented a boy shown at one or two previous meetings of this society. He called the attention of the society to the fact that the edema of the ocular conjunctiva is much less, and the child is improving in every way.

Retinal Tuberculosis.

Dr. Wm. C. Bane presented a young man, aged twenty-one years, first seen in July, 1914. At that time he had poor vision in the right eye, with slight vitreous haze. He was given potassium iodid to clear the vitreous. At that time the urine was negative. Three days later the vision of right eye was reduced to 5/10, and there was a flame hemorrhage on the nasal side of the disc. This improved to 5/5, and the vision remained good until April, 1916. He developed a psoas abscess on the left side and, although the vision was poor for a short time, it improved again, and then it failed so that at the present time he can recognize hand movement only. There is a grayish black mass in the vitreous. The patient gives a negative von Pirquet test and a negative bovine tuberculin test, but by subcutaneous injection of tuberculin the test is positive. This red crescent is near the lower margin of the right disc.

Discussion.—Dr. Melville Black said Dr. Bane's first case of exophthalmos shows the tremendous traumatism which an eye will sometimes stand with a very good recovery. This shows what an eye may be made to tolerate in extreme cases, although eyes will not always recover so well. He called the attention of the society to the circulation in the central artery and vein, and that this is present in spite of the fact that the optic nerve had been cut in two. He cannot produce exsanguination of this by his test.

Dr. M. Black also called to the attention of the society that Dr. Bane's second case is very typical of retinal tuberculosis with recurring hemorrhages, and probably later will show proliferating retinitis.

Dr. E. R. Neeper said Dr. Bane had a perfect result in his first case.

Dr. Wm. H. Crisp thinks the red crescent in Dr. Bane's second case is due to contraction of the hemorrhage in the vitreous chamber.

Dr. W. A. Sedwick thinks this may possibly be a new growth, and believes it should be watched with this in mind.

Dr. Melville Black said that transillumination is very good.

Dr. A. C. Magruder said the crescent gives a red retinal reflex from the hemorrhage, and he does not believe this is a growth. He believes later on this will change so it will give a little different impression.

Conjunctival Laceration—Hyphema.

Dr. H. R. Stilwill presented Mr. V. B., aged sixty-two years, a carpenter, first seen March 25, 1917. The day before the patient had received a blow over the right eye from the brake lever of a hand car. When seen the following day there was much swelling and discoloration of the lids, edema of the conjunctiva, and a horizontal ragged cut through the conjunctiva at the temporal side. The anterior chamber was filled with blood, the eyeball was soft, the cornea was clear, and the vision nil.

Discussion.—Dr. E. T. Boyd said the eye should be enucleated. It should also be done, he believed, in Dr. Burns' case.

Dr. Wm. C. Bane seconded this.

Dr. Melville Black thinks we cannot be too careful in these cases. He recommended removal of the eye in order to do the thing which will be for the best interest of the patient and save the other eye.

Dr. J. A. Patterson thought the low tension was due to retinal detachment from the severity of the blow. He believes the eye will become firmer as time goes on, and he would wait, if it were his case, before recommending enucleation.

Probable Abscess of Orbit.

Drs. H. R. Stilwill and D. H. Coover made a further report upon the boy with proptosis who had been presented at a previous meeting. Dr. Coover has put this case in the Children's Hospital recently.

The exophthalmos is now three diopters, and the vision 4/4 —, with the temperature 99° by mouth.

Dr. Coover asked the society what should be done for this boy. He is becoming more and more cachectic, the eye movement more and more limited, especially up and out. The X-ray examination showed a shadow at the apex of the orbit.

Discussion.—Dr. Wm. C. Bane thinks pus is present in the orbit.

Dr. J. A. Patterson asked if the tuberculin test had been made.

Dr. Coover replied that he has been thoroughly examined, although he gives a tuberculous history, and this has been conceded. He has pain only when he runs.

Dr. Stilwill said trauma was a possible factor, as the boy gave a history of injury from a bicycle last June.

Dr. Melville Black expressed the opinion that the tension is not from the eye but from pus back of the eye. He probably has tuberculosis. The eye is free from inflammation. He thinks there is a tumor of some type at the apex of the orbit, and this is probably not tuberculous, although the child has some tuberculous involvement in some part of the body. He would build up the child in every way possible, and later, if necessary, operate.

Dr. E. R. Neeper believes there is some tumor at the apex of the orbit. He would build up the child in a general way and give him tuberculin treatment. Later he would explore the orbit. He does not favor any radical operation at the present time, as he does not believe the child's condition is favorable for this.

Dr. E. T. Boyd would do a radical operation now. He would evacuate the pus, if pus is present, or remove the tumor, in case it is found during the exploratory operation.

Dr. J. A. Patterson stated that tumor is a broad word. He believes we should consider the boy's general health first, and second, the vision of the eye involved.

Dr. D. H. Coover called the attention of the society to a case reported of a tuberculous tumor of the orbit in the last number of *Ophthalmic Literature.* This was by a Russian oculist.

Dr. E. R. Neeper congratulated Dr. Bane on the skillful result he has obtained with his postoperative case of tumor of the optic nerve. He said he did not believe most cases would turn out so well. He would hesitate to do so radical an operation in Dr. Coover's case.

Eye Injury.

Dr. H. R. Burns presented J. L. B., forty-one years old, colored, who met with an injury to his eye on March 8th, when he was struck in it by a bunch of keys which had been pitched to him. The lens he was wearing before the right eye broke in pieces, and a piece of the lens cut his cornea from 11 to 5 o'clock. There was a cut about three millimeters long in the limbus and the sclera at 5 o'clock. Also a slight cut in the cornea toward 4:30 o'clock. The lens was cut and the anterior chamber partially filled with blood.

Dr. Burns cleaned out the anterior chamber and removed, as he thought, all of the lens substance. Then he dissected up the lower half of the conjunctiva and sewed it over the cornea to the upper conjunctiva. March 13th he removed the stitches. The cornea was healed and he could see about one-sixth of the lens, which was not removed at the time of the operation. At no time has there been pain of any moment. The lens is now nearly absorbed, and vision is nil.

Discussion.—Dr. W. A. Sedwick said the cut flap is slightly adherent and part of the lens is fastened to the cornea.

Dr. Melville Black said the case illustrates the value of a conjunctival flap. It is a dangerous, sightless eye and should be watched. It may and probably will need removal.

Dr. W. H. Crisp said he had recently dismissed a patient who had been shot with an arrow. This case was shown before the society at a previous meeting. Atropin was used freely, and the eye recovered, so that he thought for the present it was not necessary to enucleate it.

Retinitis Pigmentosa.

Dr. W. A. Sedwick presented a man from the eye clinic with a very indefinite history. His vision had failed gradually. He gave a history of pimples on his penis—one each day for three days; he also received treatment at Hot Springs. Vision in right eye, 10/40, and in left eye, 10/50. Fields of vision contracted. Retina and choroid were both involved. The case had all the appearances of retinitis pigmentosa.

Discussion.—Dr. E. T. Boyd said the history is not one which would lead you to think of retinitis pigmentosa. He thinks the disease may be specific.

Dr. Wm. C. Bane considers this pigment atypical.

Dr. E. R. Neeper also considers the case atypical, as there is no history of night blindness. The pigment is not typical.

Dr. J. A. Patterson said not all cases of retinitis pigmentosa are typical. He believes it is very definitely a case of retinitis pigmentosa.

FRANK R. SPENCER,
Secretary.

WILLS HOSPITAL OPHTHALMIC SOCIETY.

Meeting held March 6, 1917.

Secondary Glaucoma Caused by Hyperreactive Cataract.

Dr. P. N. K. Schwenk showed a third case of secondary glaucoma caused, in his opinion, by a hyperreactive cataract. He first saw this case in October, 1906, when there was a cataract in the left eye, and the right eye had 6/9 vision with correction. Right eye showed incipient lens haziness. On October 11, 1916, the left eye became inflamed, cornea steamy, pericorneal zone injected, pupil small. Atropin and antirheumatic remedies were given. On October 26th the eye appeared much improved. On November 8th severe pains developed, eye became injected, and tension was plus two. Atropin was discontinued. December 5th, advised removal of lens, posterior sclerotomy, and iridectomy. Admitted to hospital. History was obtained revealing loss of vision in left eye for past ten years. No pain until a few weeks ago, since which time pain has been more or less constant. Left eye shows injection of the deep ciliary vessels and pericorneal zone, cornea dull, iris discolored. Pupil small and fixed, greenish reflex. Lens cataractous, no fundus reflex. Right eye shows incipient cataract. On December 7th a posterior sclerotomy, iridectomy, and lens extraction was performed. December 16th the corneal wound had healed and pillars of iris were free. December 20th, eye quiet. Vision with $+ 9.00 \bigcirc + 4.00$ axis 180°, was 6/12.

Dr. Schwenk presented this case as being unique in that there was little hope of visual improvement, the operation being done for the relief of the inflammatory symptoms. He considers that the hyperreactive lens causes a chemical irritation which gives rise to a condition simulating glaucoma. It is his opinion that removal of the lens alone would ameliorate this condition. An iridectomy alone would be ineffectual. Therefore, in all cases of secondary glaucoma an iridectomy with lens extraction is the proper procedure.

Bilateral Staphyloma Caused by Scalding With Hot Water.

Dr. Schwenk also showed a girl, six years of age, having bilateral staphyloma of the cornea, caused by scalding with hot water. The face is uninjured. The right eye shows a small rim of iris in upper part of cornea. The left cornea is so bulged forward as to render closure of the lids impossible. An iridectomy is indicated in the right eye. The left eye should be enucleated.

Interstitial Keratitis.

Dr. William Campbell Posey showed three cases of interstitial keratitis: (1) In a tubercular girl, in whom the inflammation had invaded but one eye and had yielded rapidly to the hypodermic administration of old tuberculin. The general health of the patient had also improved greatly. (2) In a boy, the subject of inherited lues. Both eyes characteristically affected. Disease yielding slowly to mercurial inunctions. (3) In a girl with hereditary syphilis. Mercurial inunctions seemed to have availed nothing. When first treated, right eye alone affected, fellow eye being attacked three weeks later, despite mercury. Salvarsan twice administered, beneficial effect appearing in one week after last dosage.

Secondary Glaucoma, With Large Staphyloma of Cornea Following Perforating Ulcer the Result of Granular Conjunctivitis.

Dr. Posey also showed a girl with secondary glaucoma, with large staphyloma of cornea following perforating ulcer the result of granular conjunctivitis. The girl had been under his care from childhood, and an iridectomy done at that time had been the means of conserving some vision until recently. His present attempt was to flatten the apex of the staphyloma, which had become a source of irritation to the upper lid, by caustics.

Discussion.—Dr. Posey said that he was unable to subscribe to Dr. Schwenk's views in regard to the causation of glaucoma. Years ago, operators had vainly endeavored to reduce tension by removal of the lens, but, as far as he knew, no one now practiced this procedure. When glaucoma arises in complication with cataract, the increase in tension is due to some mechanical hindrance to the escape of fluid from the angle of the anterior chamber, and is not due, in his opinion, as claimed by Dr. Schwenk, to a chemical irritation provoked by the lens substance.

Ionization Treatment of Cancer of the Eyelids.

Dr. G. Betton Massey (by invitation) showed two cases of extensive epithelioma of the orbit under treatment by zinc ionization, with apparently promising results, and reported a series of eleven cases of epithelioma and one of endothelioma of the eyelids and adjacent parts that had been treated by zinc ionization during the past eleven years, all but one of which had resulted in eradication. Nine of these had been well more than three years. He regarded the zinc ionization method with the unipolar technic to be peculiarly well adapted to small malignant growths in these situations, because of the ease with which low volt direct currents may be handled. For larger growths the bipolar technic was more effective, as we may then conjoin the cooking effect of a heavy current developing heat within the growth itself as an adjuvant to the destructive action of the ionization. These methods are bloodless, and result in sealing the absorbents at the edges of the destroyed area, thus preventing operative reinfection.

Dr. Massey also reported six cases of inoperable, recurrent malignant growths of the orbital cavity that had followed enucleation of the eye for malignant disease. These had been placed under some form of zinc ionization during the past twenty years, resulting in one operative death and only palliation in the remaining cases. The more recent bipolar technic may yield better results in cases in which the disease has not passed beyond the orbital foramen.

Infected Ulcer of the Cornea.

Dr. Zentmayer also presented a patient on whom the Kuhnt-Heisrath operation had been performed. There was an infected ulcer of the cornea with a small descemetcele. Despite the threatened perforation, steady improvement followed the operation upon the lids and almost complete healing has resulted.

Berens' Operation for Symblepharon.

Dr. William Zentmayer presented a patient on whom he had performed the Berens operation for symblepharon. There was a rather broad adhesion between the lid and the cornea at the position of an adherent cicatrix. The operation consists in dividing the band at its middle and tying sutures which have been made to transfix the band at the position of its two points of origin, across the face of the cut ends. This operates to turn the raw edges inwards.

Detached Retina.

Dr. Burton Chance exhibited a case of detached retina in a little boy of five years, from the fundus of whose right eye, at about Christmas time, was noticed a whitish glare. The child had been healthy except for an attack of measles, which had lasted, so the parents thought, longer than other cases they knew of; and on July 4th of last year he fell down steps, striking the back of his head, which fall did not, however, give rise to any special symptoms. When examined January 20th, the pupil was fully dilated, evidently from the use of a solution by the family physician. In the lower half of the vitreous chamber there is a broad detachment of the retina, which does not tremble on movement of the globe, and it was quite translucent when illuminated. There are no evidences of iridocyclitis, but a strange "wisp" of vessels extends across the cornea from the upper limbus. The child has been under observation weekly, the conditions have not changed, and he is in good health. The eye is neither painful nor tender. The tension did not at first seem to be increased, but today it is distinctly greater than is the tension of the fellow eye.

Extensive Atrophy of the Choroid.

Dr. Chance also exhibited a case of extensive atrophy of the choroid in a man of about seventy years, who has been in good health, and in whom the Wassermann reaction is negative. There has been nothing in his business that would give rise to such atrophy. Here and there, large surfaces of the sclera are seen. There is but little secondary pigmentation. The macular region is intact, and the corrected visual acuity equals 6/30.

Angioma of the Orbit.

Dr. Chance also showed the operative results in the case of angioma of the orbit which has been already shown to the society. In its dissection the angioma was found to be circumscribed. The superior and external rectus muscles were involved in the mass, and their attachments had to be sacrificed. Much blood was lost, so that the patient is anemic, and has been feverish for the past three days. On attempting to rotate the globe, distinct pulsation is noticed, which pulsation causes us to entertain the idea that there might be some disorder of the orbital vessels.

Harold W. How,
Secretary.

having trachoma should not be admitted to school without a certificate that they had been treated. Treatment in the school building is not desirable, and it is not necessary to have special schools for the trachoma children, but in the school rooms they might have their seats together in a certain quarter of the room.—*Jour. A. M. A.*, June 9, 1917.

AWARD OF THE SEAMAN GOLD MEDAL.—The Seaman gold medal, given by Dr. Louis Livingston Seaman, and annually awarded by the American Museum of Safety for progress and achievement in the promotion of hygiene and the mitigation of disease, has been conferred on the Julius King Optical Company for scientific research and progress achieved in overcoming the harmful effects of ultraviolet and infrared rays of light in connection with arc welding and other industrial processes at very high temperatures.—*Jour. A. M. A.*, July 7, 1917.

THE CONTROL OF SYPHILIS.—At Cincinnati, on May 23 and 24, the American Association on the Control of Syphilis was organized with a charter membership of twenty-nine. The objects of the association are the promulgation among medical men, medical institutions, boards of health, hospital boards, dispenary attendants and boards and other organizations of knowledge of syphilis. It is expected that the association will develop the importance of the social and economic sides of this question; will collect standardized statistics from institutions now treating syphilis; will further the establishment of free clinics and dispensaries in the diagnosis and treatment of the disease, and will encourage the more comprehensive teaching of syphilis in medical schools. The following officers were elected: President, Dr. Martin F. Engman, St. Louis; vice-president, Dr. Jay F. Schamberg, Philadelphia, and secretary-treasurer, Dr. Harry E. Kleinschmidt, St. Louis.—*Jour. A. M. A.*, June 9, 1917.

Army, Navy and National Defense.

AMONG the ophthalmologists serving in the State Committees of the Council of National Defense are: Edward Jackson, Denver; William H. Wilmer, Washington; William H. Wilder, Chicago; Walter R. Parker, Detroit; S. W. Lambert, New

York; C. P. Franklin, Philadelphia; Edward B. Heckel, Pittsburgh; George de Schweinitz, Philadelphia; Charles W. Kollock, Charleston; E. C. Ellett, Memphis.

Inauguration of First Aid Service.—Under John Moore (1826-1907), surgeon-general during 1886-1890, instruction in first aid was inaugurated in the service in 1886. This was one of the most important steps for the welfare of troops, in connection with which the first aid books of Dietz, Smart and Pilcher were published and the Hospital Corps of the United States Army was organized by Act of Congress in 1887, resulting in the drill manuals of Pilcher, Heizmann, Hoff, Havard, Woodhull and Dietz.—Lieut.-Col. C. C. McCulloch, Jr., U. S. Army: The Scientific and Administrative Achievement of the Medical Corps of the United States Army, *The Scientific Monthly.—Jour. A. M. A.*, June 2, 1917.

A branch of the Naval Medical College is being conducted in Philadelphia because of the overcrowded condition at the Naval Medical School at Washington. A six weeks' intensive course of instruction will be given at the Jefferson, Medico-Chirurgical, the Philadelphia General, and the Naval Hospital. Dr. T. B. Holloway is instructor in ophthalmology.

Casualties in the Medical Corps of the British Army.—There has been such an astonishing amount of misinformation, exaggerated and sensational statements, published in this country regarding the casualties among medical officers in the British Army that Col. T. H. Goodwin of the British Army Medical Service, now in this country, cabled to the British War Office for the actual facts. He received the following data: The total casualties among medical officers of the British forces, on the western front, from the beginning of the war to June 23, were: killed, 195; wounded, 707; died of disease, 62. Hence the total number of casualties from actual war injuries on the western front was 902, of which 195 were in killed. This is entirely different from some of the statements which have received wide publicity in this country—some even semiofficial in character—which have reacted to the detriment of the efforts to secure officers for the Medical Reserve Corps.—*Jour. A. M. A.*, July 7, 1917.

Commissioned in Medical Reserve Corps.

Dr. W. A. Sedwick, Denver; Dr. Alexander C. Magruder, Colorado Springs, president of the Colorado State Medical Society; Dr. W. C. Finnoff, Denver; Dr. William M. Bane, Denver.

Drs. Frank R. Spencer and Guy Clifton of Boulder have been placed upon the list as ophthalmologists in a prospective Red Cross Base Hospital Unit.

Dr. Casey A. Wood, Major M. R. C., in charge, with Capt. Norval Pierce, of examination of candidates, Aviation Section, Signal Corps, U. S. Army, Central Department, Unit No. 1.

Dr. Frank C. Todd, Captain M. R. C., in charge of examination of candidates, Aviation Section, Signal Corps, United States Army, at Minneapolis, Minn.

Dr. W. H. Wilder, Major M. R. C., engaged in the examination of candidates for the Medical Officers' Reserve Corps, Chicago.

Dr. Sydney Walker, Jr., Lieut. Junior Grade, Assistant Surgeon United States Navy, engaged in examining candidates for the United States Navy at the recruiting station, Chicago.

Dr. Richard J. Tivnen, appointed a member of the National Exemption Board, Chicago District, Board No. 2.

Personal.

Dr. Harvey Howard, who spent a number of years in hospital work in diseases of the eye in the Orient (Canton, China), is spending a good part of the summer in Denver, where he is engaged in special studies in ophthalmology.

Dr. Marcus Feingold, professor of ophthalmology at Tulane University, New Orleans, together with his wife and daughter, is spending the summer in Colorado.

Dr. George F. Libby, who has been taking a year's rest on account of his health, and who passed the winter at Roland Park, Maryland, is spending the summer with his wife at

Charmian, Pennsylvania. Dr. Libby, whose health has greatly improved, expects to resume practice in Denver at the end of the summer.

Meetings.

The Colorado Ophthalmological Society will hold its third meeting in Denver, Colorado, on August 9th and 10th.

The next examination given by the American Board for Ophthalmic Examinations will be held beginning on October 30, 1917, at Pittsburg, following the meeting of the American Academy of Ophthalmology and Oto-Laryngology. Those who desire to take the examination and be certified by the Board, should make application before August 1, 1917. Application blanks, etc., may be secured by addressing F. C. Todd, M. D., Secretary, 506 Donaldson building, Minneapolis, Minn.

The ninth semiannual session of the Sioux Valley Eye and Ear Academy, embracing Iowa, Nebraska and South Dakota, will be held at Hotel Fontanelle, Omaha, Nebraska, July 16, 1917.

Appointments.

Dr. Luther C. Peter has been appointed professor of ophthalmology in the Temple University, and ophthalmologist to the Friends' Hospital, Philadelphia, positions held for many years by the late Dr. Wendell Reber.

Dr. Paul J. Pontius has been appointed visiting ophthalmologist to the Philadelphia General Hospital, succeeding the late Wendell Reber.

Dr. L. Webster Fox was again elected president of the Pennsylvania Home Teaching Society and Free Circulating Library, for the Blind.

Dr. Edward Jackson has been placed at the head of the department of ophthalmology, and Dr. Melville Black will be associate professor in the reconstructed faculty of the medical department of the University of Colorado.

R. Foster Moore has been appointed assistant ophthalmic surgeon to St. Bartholomew's Hospital, London.

The staff of the "Dublin Hospital," which has recently left for France, includes Captain F. C. Crawley as ophthalmologist.

The following members have been elected as officers of the Ophthalmological Society of the United Kingdom for the year 1917-1918: President, E. Treacher Collins; vice-presidents, F. Richardson Cross, A. Maitland Ramsay, Sydney Stephenson, and A. Lawson; treasurer, James Taylor. Council: Gordon Holmes, J. Craig, H. L. Eason, A. H. H. Sinclair, R. R. Cruise and J. F. Cunningham. Secretaries, M. S. Mayou and S. A. K. Wilson.

It is stated by the *Annali di Ottalmologia e Clinica Oculistica* that Professor Bernheimer has been appointed to succeed Professor Fuchs in charge of the Vienna Clinic.

American Board for Ophthalmic Examinations.

The American Board for Ophthalmic Examinations have granted certificates of proficiency in ophthalmology to the following applicants:

Adams, Chas. F., Allport, Frank, Andrews, Jos. A., Barnes, J. Steele, Bell, Mace Hudson, Bennett, Arthur G., Black, Nelson M., Blair, Wm. H., Blue, J. B., Briggs, H. H., Brown, S. H., Bulson, A. E., Butler, Wm. K., Buvinger, Chas. W., Caldwell, Chester T., Calhoun, Ferdinand Phinzy, Carson, W. E., Clark, F. T., Clark, Chas. Franklin, Cohen, Martin, Crisp, W. Henry, Culver, Chas. M., Darling, Chas. G., Derby, Geo. Strong, de Schweinitz, Geo. E., Donovan, John A., Easton, E. T., Emerson, Linn, Fagin, Robert, Francis, Lee Masten, Fringer, W. R., Glosser, H. H., Gradle, Harry S., Greenwood, Allen, Hansell, H. F., Harrower, David, Hartshorne, Isaac, Henderson, Frank L., Holt, Erastus Eugene, Sr., Hurley, Edw. D., James, John Henry, Jervey, J. W., Jessaman, L. W., Johnson, Walter Buckley, Johnston, Wilson, Kennedy, E. W., Kirkendall, John S., Koller, Karl, Kollock, Chas. W., Lamb, Robert Scott, Lane, Arlene Laura, Larkin, Bernard, Jr., Levy, Louis, Lewis, A. C., Lewis, F. Park, Lovell, David B., Macleish, Archibald L., Marlow, F. W., Martin, Henry H., May, Chas. A., Minor, J. L., Nabers, Sam F., Parker, Walter

Robert, Patton, James McDowell, Porter, John, Posey, W. C., Ray, J. M., Ricker, W. G., Rood, Luther C., Shastid, Thomas Hall, Simpson, W. Likely, Stanford, J. B., Starr, Elmer G., Thompson, Geo. H., Thompson, Peter H., Vail, Derrick Tilton, Veasey, Clarence A., Virden, John E., Walter, Will, Weed, Harry M., Weiner, Meyer, Wells, David Washburn, Wilmer, Wm. Holland, Wolff, Julius, Wood, Casey, Yazujian, Dickran Maruke, Zentmayer, Wm.

Certificates will also be granted to certain other candidates who have not yet completed their tests by sending in their proper case reports, and lists of these additional names will be published as soon as they are acted upon by the Board.

Deaths.

G. Mellinger, professor of ophthalmology and chief of the eye clinic of the University of Basel, died suddenly May 21st.

Edward Michael McCabe, M. D., New Haven, Connecticut, instructor in ophthalmology at Yale University, and ophthalmoolgist to the St. Francis Hospital Asylum, New Haven. died at his home June 7th, aged fifty-three years.

Addison Cornelius Posey, M. D., Hanford, California, aged sixty-eight years, was found dead in his home May 31st, from heart disease.

A. von Hippel, formerly professor of ophthalmology in the University of Göttingen, died two days after the celebration of his seventieth birthday.

W. Franklin Coleman, once professor of ophthalmology in the Post-Graduate Medical School of Chicago, has died at the age of seventy-nine years.

The death is announced of Julien Masselon, for the whole of his professional life chef de clinique to de Wecker. Masselon was born at Rouen, where he received his medical education. In June, 1871, he entered de Wecker's clinic. He made many contributions to ophthalmic literature, almost always in association with de Wecker, the sole exception was his "Precis d'Ophthalmologie Chirurgicale," published in 1886. After the death of de Wecker in 1906, Masselon retired to the country, although his master had bequeathed to him the clinic of the Rue du Cherche-Midi.

Francesco Francaviglia, the well-known Sicilian ophthalmic surgeon, is dead from cerebral hemorrhage, aged seventy-four years.

Nicolo Manfredi has died at the age of eighty years.

The death is announced of Professor Haltenhoff, of Geneva, at the age of seventy-two years.

The death of Dr. Menacho, of Barcelona, editor of the *Archivos de Oftalmologia Hispano-Americanos*, is announced.

The deaths of the following German ophthalmic surgeons are reported in the *Annali di Ottalmologia e Clinica Oculistica:* Professor Ulrich, aged sixty-seven years; Professor Schmidt-Rimpler, aged seventy-seven years; Professor Birnbacher, aged sixty-four years; and Professor Stilling, aged seventy-three years.

The deaths of the following American ophthalmic surgeons are announced: Howard Marsh, aged forty-five years; George W. Robinson, aged fifty-three years; Frank A. Ford, aged forty years; H. D. Holton, aged seventy-nine years; M. R. Pritchard, aged sixty-four years; and J. L. Moffett, aged sixty-three years.

A MERGER OF OPHTHALMIC JOURNALS.

Through various channels the ophthalmologists of America have learned in the last few months of a proposal to merge some of the existing ophthalmic journals into one stronger, more valuable publication; that should avoid unnecessary duplication of material and keep its readers in touch with the ophthalmic literature of the world. We are now glad to announce that these plans have so far developed as to make pretty certain the appearance of the new journal at the beginning of the next year. The subscriptions already received for such a journal offer an adequate financial support.

It is definitely decided that the following journals will be merged in the new publication:

The Annals of Ophthalmology

The Ophthalmic Record

Ophthalmology

The Ophthalmic Year Book

Ophthalmic Literature

In addition, it is probable that one or two other ophthalmic journals will join in the enterprise.

The editorial staffs of these publications, with the united support of the ophthalmologists of America, will be able to issue an ophthalmic journal that will compare favorably with any in the world; and one which may be expected to aid and keep pace with the development of ophthalmic science. A more detailed account of these plans will be laid before our readers in our next issue.

PUBLISHER'S APPRECIATION.

With this issue the ANNALS OF OPHTHALMOLOGY, after being published for twenty-six (26) years under its present name, comes to a close, having merged with the different journals to form the *American Journal of Ophthalmology.*

The Merger Organization being composed of high class, capable medical men who desire the best in ophthalmology, and appreciating that by all the publications consolidating a better journal could be furnished to the subscribers, and feeling that in the merger the ANNALS OF OPHTHALMOLOGY will not entirely lose its identity as one of the foremost ophthalmologic journals, I have joined the consolidation, realizing that in the new *American Journal of Ophthalmology,* America will have the greatest ophthalmologic journal published.

The ANNALS OF OPHTHALMOLOGY and the ANNALS OF OTOLOGY was founded by my brother, Dr. James Pleasant Parker, in 1892, and published as one journal. Through the persistent hard work of himself and those who joined him in establishing that publication, the journal was a success, both from a financial and literary standpoint, from the start.

On February 6th, 1896, my brother died. Feeling that his labor and sacrifice for the scientific progress of ophthalmology should be perpetuated, I felt that the ANNALS should continue and the entire editorial staff who had been associated with him be[illegible]lling to continue their labors, I continued that publica[illegible] 1897, when the journal was issued as two publica[illegible] ANNALS OF OPHTHALMOLOGY, and the ANNALS OF [illegible] RHINOLOGY AND LARYNGOLOGY. I found willing [illegible]ong the leading men of the medical profession to [illegible]ue the work and to contribute to both of these publica[illegible]s. I feel that with their hearty co-operation and that of the medical profession in general, these two publications are a monument to the founder of the ANNALS OF OPHTHALMOLOGY AND OTOLOGY.

I therefore feel that I owe to the contributors, workers and subscribers to the ANNALS OF OPHTHALMOLOGY a debt of gratitude and my sincere thanks for all they have done to continue the work started by my brother.

JONES H. PARKER.

THE ANNALS
OF
OPHTHALMOLOGY

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XXXII.

OCULAR PALSIES IN INFANTILE PARALYSIS. REPORT OF TWO CASES.*

ALBERT C. SAUTTER, M. D.,

PHILADELPHIA.

While in the majority of cases of infantile paralysis the cord alone is involved, the occasional occurrence of head symptoms shows that the infectious process does not always confine itself to the cord structures, the frequency and severity of such complications probably varying in different epidemics. Medin[1] was the first who considered involvement of the cranial nerves a not especially unusual complication of infantile paralysis, and he is credited with recognizing the etiologic connection between certain isolated cranial nerve palsies and infantile paralysis. Wickman[1] believes that mild and transitory involvement of the cranial nerves, no doubt often overlooked, is much more apt to occur than destructive lesions of those structures, the injury to the ganglion cells in the nuclei being limited to tigrolytic changes. According to Weisenburg,[2] all cranial nerve palsies in infantile paralysis are due either to a nuclear or intramedullary lesion. The prognosis as to restoration of nerve function is regarded as favorable in the majority of instances.

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*Read before the Eye Section, College of Physicians, Philadelphia, April 19, 1917.

Uhthoff[3] is inclined to consider ocular complications in infantile paralysis as extremely rare, and claims the cases which have been reported as such generally complicated atypical forms of the affection, cases often complicated with meningeal or cerebral symptoms. However, the occurrence during epidemics of cases exhibiting only bulbar or pontine symptoms, the occasional occurrence of such symptoms in one member of a family while other members present the usual picture of poliomyelitis, is certainly suggestive of a common underlying cause. In these instances the spinal symptoms may be entirely absent, or there may be only loss of tendon reflexes, circumscribed muscle hypotonus, or other mild spinal symptoms.

Cranial palsies may complicate cases resembling the Landry type of paralysis, a rapidly ascending, generally fatal type, or less frequently the descending type of the disease. In the bulbar-pontine variety, paralysis of the facial nerve is the most usual complication, paralysis of the extraocular muscles per se occurring more rarely. Of these the abducens and oculomotor nerves, in order of frequency, are most apt to be involved. Sometimes, however, a more or less complete ophthalmoplegia intervenes which is usually unilateral. According to Wickman, in most of the cases of unilateral ophthalmoplegia, the levator escapes; ptosis may, however, be an isolated symptom.

Involvement of the optic nerve is rare. Wickman claims to have seen one case of optic neuritis during the acute stage of the disease, and also refers to a case of amaurosis with optic nerve atrophy reported by Tedeschi. Posey and Swindells[2] report a case of simple optic nerve atrophy associated with paralysis of the sixth nerve. The resemblance of the atrophy to a simple optic nerve atrophy suggested a toxic rather than a meningeal origin. Uhthoff states the literature contains no mention of the optic nerve being affected in infantile paralysis. E. Mueller[1] found no fundus abnormalities in the cases he studied.

The following two cases were observed by the writer at the Philadelphia Hospital for Contagious Diseases, during the recent epidemic of infantile paralysis. For the hospital notes which follow I am indebted to Dr. S. S. Woody.

Case 1.—Bilateral External Ophthalmoplegia. William C., two years old, white, admitted to the hospital on September 2, 1916, on the fourth day of the disease. Previous and family history unimportant.

The first symptoms noted were weakness in the lower extremities and constipation. On admission child was stuporous, neck rigid, there was slight weakness of the arms and both lower extremities, knee jerks present, plantar reflexes exaggerated, no distinct paralysis of any muscle group.

Examination of eyes, ears, nose, throat and mouth proved negative. Temperature, 101.2°. During the ensuing two weeks temperature gradually subsided to normal, but the patient seemed restless and appeared at times slightly delirious. There were signs of a conjunctivitis and inflammation of the external auricle.

On September 30th child appeared brighter, was able to move his arms better, and eye and ear conditions had improved.

On October 5th it was apparent that the eyes were fixed, and there was ptosis in the left eye. Child seemed rational, and general condition fair. The writer saw the patient on the same day and verified the above findings. There was a complete bilateral external ophthalmoplegia with a moderate ptosis in the left eye. The pupils were equal and reacted well to light. The child seemed able to see objects held in front of him. The examination of the eye grounds disclosed nothing abnormal. Patient was discharged from the hospital on October 11th.

Examination two weeks later by the writer showed the same ocular condition as noted above. General condition much better, child able to walk without assistance. No fundus changes.

February 12th, eyes can be moved slightly in the horizontal plane; accurate examination is, however, extremely difficult on account of the age of the child. The left eye deviates slightly upward, the right pupil is somewhat larger than the left, but light reaction in each eye is normal.

During the past two months there has been practically no improvement, and the exceptionally long duration of the palsy (six months) renders the prognosis dubious.

Posey and Swindells[2] report a case of bilateral external ophthalmoplegia recovering completely within two weeks. Wickman refers to a case of bilateral external ophthalmoplegia, occurring in Breslau during the 1909 epidemic, associated with bilateral partial ptosis. Takahashi[1] reports a similar case in the same epidemic, characterized by paralysis of the trochlear and external oculomotor branches, with slight paralysis of the facial and hypoglossal nerves.

Case 2.—Paralysis of the Conjugate Lateral Movements of the Eyes. William B., colored, four years old, admitted to the hospital September 28, 1916, on the second day of the disease.

Family History.—Father and mother living and well. One brother has infantile paralysis, one sister succumbed to the same disease on September 21, 1916. Patient had measles in 1914.

Present illness began with vomiting, fever and prostration.

On admission, physical examination disclosed eyes, nose, throat and mouth negative; neck and back muscles weak; heart and lungs negative; extremities not involved.

September 29th, knee jerks markedly increased on right, spastic condition. Left knee jerk elicited after repeated efforts. Babinski on both sides; Kernig plus on both sides; extensor reflexes upper extremities plus. Respiratory involvement moderate, right facial paralysis, eye partially open when asleep.

Treatment consisted in lumbar puncture and intraspinal injections of adrenalin chlorid.

On October 1st patient's general condition had improved, and facial paralysis was hardly in evidence.

On October 3d Dr. Weisenburg noted paralysis of the conjugate lateral movements of the eyes to the right, right facial and right leg weakness.

October 9th, all extremities normal, slight paralysis of the right side of the face.

On October 16th the writer saw the patient for the first time, and made the following notes: No apparent spastic conjugate deviation, paralysis of dextroversion, marked nystagmus on turning eyes to the left, convergence impaired. The corneæ were clear, the pupils equal and reacted well to light and convergence. No changes were detected in the eye grounds.

Patient was discharged from the hospital on October 30th in excellent physical condition, but with no change in his ocular palsy.

The case was not seen again until April 11, 1917, when examination revealed only slight impairment of dextroversion.

The writer reviewed six hundred and sixty-nine case histories of infantile paralysis at the Philadelphia Hospital for Contagious Diseases, the data being based mostly on observations of the house and visiting medical staff, who, in spite of the large number of cases admitted during the summer and autumn of 1916, were able to keep satisfactory records. It is to be regretted, of course, that only a small proportion of these were seen by a neurologist or an ophthalmologist. Still it was thought at least a general idea concerning the frequency of ocular complications during the recent epidemic would be of interest.

Among the six hundred and sixty-nine cases enumerated, nineteen, or about three per cent, showed disturbance of the extraocular muscles, comprising thirteen cases of unilateral sixth nerve paralysis, four of which were complicated with seventh nerve paralysis. Bilateral sixth nerve involvement occurred in three cases, external ophthalmoplegia and paralysis of the associated ocular movements each in one case. Ptosis, uncomplicated with other ocular palsies, was observed in one case; combined with other ocular lesions in two cases. Nystagmus was noted in several cases. (Histories containing references to pupillary abnormalities unassociated with other eye lesions were purposely excluded from the list of eye complications.)

In seven of the nineteen cases the cranial nerves were the only nerves affected. Death resulted four times. In the few cases examined ophthalmoscopically no fundus changes were observed.

Paralysis of the facial nerve was a comparatively frequent complication, occurring in seventy-eight patients, eighteen of whom died.

In accord with the findings of previous investigators, we find the seventh nerve most frequently involved, then the sixth, and least often the oculomotor nerve. Medin's[1] analysis of sixty-four cases showed nine cases of facial palsy, in three of which it was the only symptom; five with hypoglossal paralysis, six with paralysis of the abducens, four with eleventh nerve involvement, three with third nerve palsy, one with trigeminal, and one or two with tenth nerve involvement.

Wickman[1] in the Swedish epidemic in 1905 found in eight hundred and sixty-eight cases isolated cranial nerve palsies in twenty-two, combined cranial and spinal nerve palsies in thirty-four.

Leegard[1] in three hundred and eleven cases taken from the Norwegian epidemic in 1905 reports only two isolated cases of facial palsy, and three cases associated with spinal symptoms, also one case of ptosis with spinal symptoms.

E. Mueller[1] in one hundred cases found thirteen facial palsies, three unilateral abducens palsies; no other nerves involved.

Zappert[1] in two hundred and ninety cases from the Vienna epidemic in 1908 found cranial associated with spinal nerve lesions in twenty-five patients.

In the New York epidemic in 1907[1] an analysis of seven hundred and fifty-two cases showed twenty-seven facial, eighteen lid palsies, and twenty-six cases of strabismus.

BIBLIOGRAPHY.

1. Wickman: Lewandowsky's Handbuch der Neurologie, Vol. 2.
2. Opththalmic Record, December, 1916.
3. Uhthoff: Graefe-Saemisch XI, 2, p. 308.

XXXIII.

A CASE OF CAVERNOUS ANGIOMA OF THE ORBIT.*

(WITH PHOTOGRAPHS AND RADIOGRAPHS.)

BURTON CHANCE, M. D.,

PHILADELPHIA.

An angioma, involving the globe and extending into the orbit, presenting several interesting features, was found in a well-developed Slavic girl of sixteen years, who was assigned to my care at the Wills Hospital early in January, 1917.

The tumor was noticed soon after her birth. It gradually increased in size until it occupied the upper half of the left orbit. In the course of years the patient experienced neither pain nor tenderness, but was annoyed by the deformity produced by the tumor. During emotional excitement, when she stooped, as during household occupations, when she slept, and when she violently blew her nose, the tumor protruded through the fissure. The tumor did not become altered at physiologic periods, nor modified in appearance or in its general character, as observable by her family, in all these years. It had never been inflamed, nor had it been wounded at any time, nor had it ever bled.

When the patient presented herself at the hospital the upper lid lay flat in complete ptosis, and was of darker color than the right. The orbital ridge was not so prominent as that of the opposite side. On raising the lid a purplish mass instantly protruded through the fissure, like an enormous staphyloma of the sclera. The true nature of it was soon manifested by an increasingly greater protrusion so that the lid was held up by the pressure of the mass. When fully protruded it reminded one of the placenta; tortuous and dilated conjunctival vessels coursed over it, and on palpation it was soft and compressible, but could not be emptied of its apparently fluid contents. The conjunctiva could be gathered up from the surface of the tumor and easily slid over it. The surface of the tumor felt beneath the conjunctiva as though it were fibrous, being smooth and apparently without knobs; and there was no sensation such as is presented by the presence of varices.

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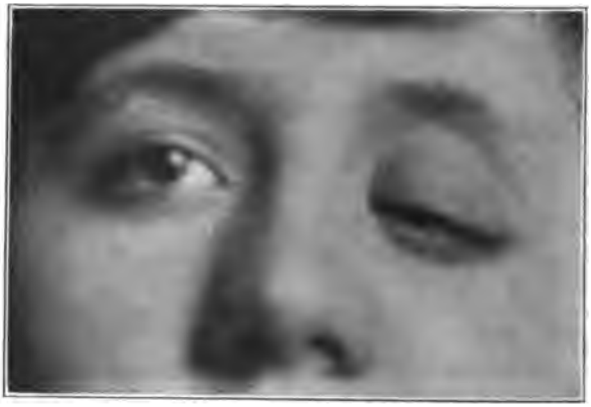
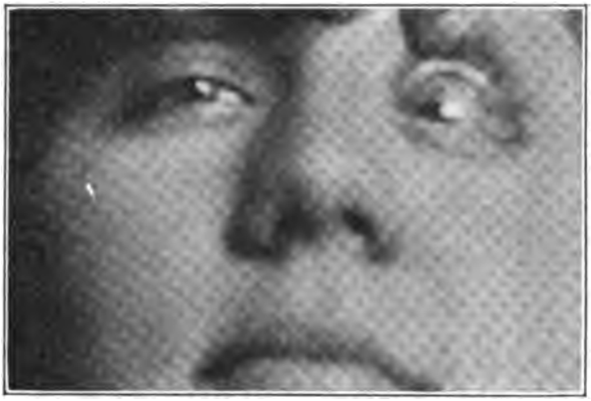
*Read at the fifty-third annual meeting of the American Ophthalmological Society, Virginia Hot Springs, Virginia, May 29-30, 1917.

The tumor rested on the globe, and extending from about the upper border of the internal rectus, closely adjacent to the cornea, passed over onto the external rectus, backwards indefinitely and forwards into the lid well up to the tarsal cartilage. The great volume of the mass was accommodated by an absence of the orbital ridge in the middle third, and further by a fenestra in the external orbital wall, while on deep digital examination the roof of the orbit, too, was found to be lacking in the middle portion. The trochlear could be felt with singular distinctness. As already mentioned, the mass was most compressible, so that when deep pressure was made upon the closed lid, and with the hand over the temple, protrusion through the fenestra could be felt.



The photographs show quite well the protrusion of the mass. They were taken under great difficulty by Dr. Nelson Brinkerhoff, but the girl's struggles to resist caused the mass to protrude all the more readily. We were not able to get a view showing the relation of the tumor to the eye itself.

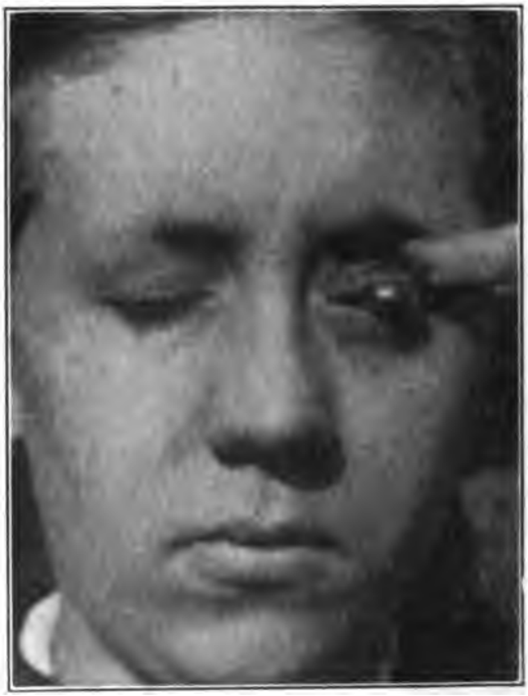
One series of measurements, of as much of the mass as could be seen, made while the girl lay flat on the bed, at which time the mass spontaneously protruded, as was its wont, showed a circumference from the outer to the inner scleral border of fifty-five millimeters; directly across, forty millimeters; antero-posteriorly, thirty millimeters; and vertically, sixteen millimeters.



Variations in volume did not appear on ordinary inspection, but deep pressure on the jugulars increased it, and pressure on the carotids diminished it. There was no inherent pulsation nor bruit, but, when the lid was held up and the patient made efforts to rotate the globe, there was a distinct pulsatile movement.

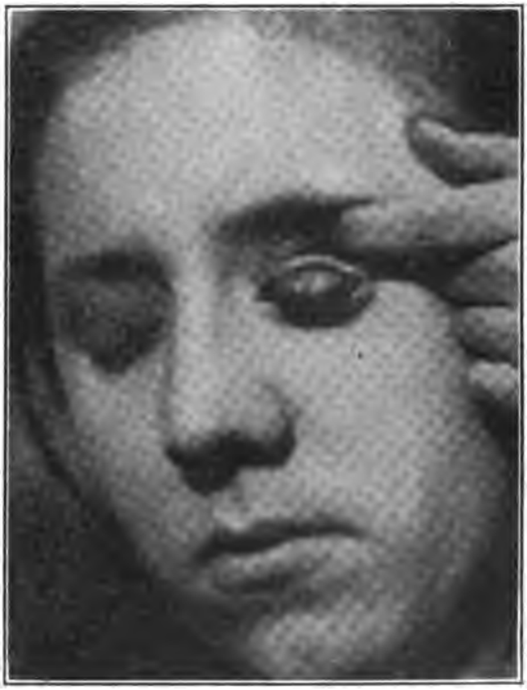
The conjunctiva was healthy and free from any markedly dilated vessels over the lower half of the globe, as well as of the lower lid. The cornea was unaffected, the fundus healthy, the disc being of fair tint but quite distorted in shape. The tarsal tissues were found to be quite thin in both cartilage and muscle layer.

The eyeball itself did not project, so there was no proptosis, but the ball was turned inwardly and somewhat downward, the cornea being well at the inner angle; yet when relieved slightly of the weight of the mass, the globe could be rotated out to the vertical meridian.



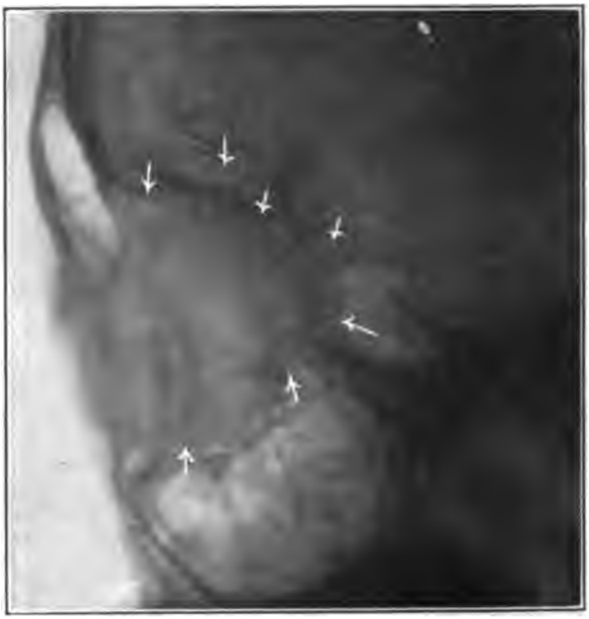
An examination of the surface of the patient's body, as reported by the nurse, showed it to be entirely free from angiomata of the skin; and none in the mouth and nose. The girl has not suffered from hemorrhoids. There is no hypertrophy of the thyroid.

A careful radiographic study of the head was made by Dr. George E. Pfahler. The plates show that the tumor extended as far back as the anterior wall of the sphenoid, but the mass was not connected with the frontal, maxillary or sphenoidal sinuses.



A diagnosis of cavernous angiomata was made. I determined to remove it by dissection rather than by electrolysis or by high frequency currents, as were suggested by certain men who studied the case with me.

Five days after admission I aspirated the mass and withdrew four syringefuls of blood, about twenty cubic centimeters. It was chocolate red in color, and it speedily coagulated into a tough clot. By accident, counter puncture was made so that air entered the sac, and caused marked distension. Roller bandages were applied at once, and pressure maintained for three days. When released, the mass was found protruding through the fissure, and did not spontaneously retract, as heretofore; in addition, on palpation the sensation was as though clotting had occurred in the anterior portion.



In consultation, Dr. Edward Martin agreed with me that the mass was caused by a circumscribed angioma, and he counseled its removal by dissection, which was done under ether, on Saturday, February 24th, Dr. Schwenk assisting me in the operation.

Dissection was begun by an incision of the conjunctiva across the horizontal diameter of the mass with a scalpel the edge of which was turned forward. As it was found that the tumor was encapsulated, the conjunctiva was stripped off both upwards and downwards for some distance with blunt pointed scissors. Soon it was found that fine fibrous strands seemed to penetrate the capsule; in the severance of these strands the capsule was lacerated, giving exit to great quantities of dark blood. The dissection was continued, with a repetition of these events. That portion of the sac which had been ruptured collapsed as the flow of blood ceased, and the general mass diminished in size. A number of such ruptures and flows followed, which led us to believe that the angioma was locular and truly cavernous. Once, during the primary conjunctival dissection, probably because of the increased general vascular pressure caused by the etherization, the globe with the whole mass protruded. It seemed then to be about

the dimension of an early hot-house tomato, quite larger than an English walnut.

When the conjunctiva was removed the surface was seen to be not perfectly smooth, but was studded with rounded projections, much like the flat mole-like bosses seen on apples. The mass did not communicate with any other mass or cyst. There were no varices, but when the dissection reached the sclera, two or three spurts of blood seemed to come from vessels, to stanch which required hemostatic forceps and ligatures. After all diameters were freed, the base on the globe was ligated and the mass abscissed. At this stage the globe became completely dislocated and the stalk of the optic nerve could be felt readily; this forcing forwards of the orbital contents was caused by the quantity of blood which had collected in the cellular tissues.

The conjunctiva was then united with silk sutures, and the ball replaced by pressure with my gathered together finger tips. The orbit being quite full of escaped blood, the lids were united at the middle line with two sutures threaded through pearl buttons. The patient exhibited signs of shock, but was resuscitated by hot saline enemas and strychnin injections.

The dissection disclosed the fact that the base of the angioma rested on the upper and outer aspect of the globe, and was quite adherent to the sclera. It extended across to the position of the upper border of the internal rectus. Here, when the conjunctiva was removed, the form of the tumor was like a group of bubbles, and in this region the attachment to the globe was not so firm as elsewhere. The major portion of the tumor, however, was distinctly globular. The superior and the external rectus muscles were involved in the tumor, and they were unfortunately irreparably mutilated in the dissection.

The dissection was most tedious, because the escaping blood flooded the field. The operation required one hour and thirty minutes.

For several days the patient was quite anemic, and during the week after the operation her temperature remained above normal. The lid sutures were removed on the fourth day because the orbital contents continued quite firm and decidedly protrudent. On the fifth day hot saline stupes were applied; on the seventh day the eye could be more distinctly seen, by reason of the softening and recession of the tumid orbital mass which had quite enveloped the globe. The cornea was not rotated inwardly so far as it had been, and the patient could see objects about her. There was no proptosis. A few days later, on attempting to rotate the globe, distinct pulsation was noticed, which pulsation caused certain of us to entertain the idea that there might be some disorder of the orbital vessels, and that the whole process might be part of a deep seated disorder.

By the end of four weeks the patient was discharged from the hospital, having fully recovered her strength and color. The orbital condition presented well marked ptosis by which the upper lid rested flatly on the globe, this appearance being due to the lack of the upper orbital ridge. The globe itself seemed to be decidedly larger than its fellow. There was no true upper fornix. Masses of tissue adhered to the sclera, and the conjunctiva lay loosely over the dissected area. The globe could not be rotated upwards or outwards.

Dr. Brinkerhoff prepared the tissues for histologic study. The tumor mass was greatly reduced in volume. It presents the characteristics of erectile tissue. There are many spaces the walls of which are fibrous, being connected with the external capsule. They are also lined with endothelium and are packed with red cells. There are many fields showing striated and unstriated muscle fibers, and in all are to be found spare round celled infiltration. There are only a few white blood cells. There are no capillaries and no signs of glandular elements and no cysts, nor are there any signs of degeneration. A study of the sections gave no clue as to the probable origin of the angioma.

A few days later tenotomy of the internal rectus was done. The subconjunctival tissues were found to be so highly vascular that the hemorrhage was copious and of the same character as that which flowed during the dissection of the tumor. The capsule was perforated with difficulty, and it seemed as though shallow flat fibrous spaces overlaid the tissues, which had been formed, perhaps, by an extension of the angiomatous tissue over the surface of the globe. The operative results, although not entirely satisfactory, are sufficient to allow an outward rotation of the globe and afford an easy ophthalmoscopic examination. While the fissure is wider than before the removal of the mass, it was deemed wise to defer operations to raise the drooping lid. The fundus is healthy in every particular, the disc has a rosier hue than at the first examination. The aspect of the fundus reminds one of the conditions commonly seen in hyperopic amblyopia ex anopsia. By a rough test with plus 4.0 cylinder, 6/30 vision was obtained.

These recent operations were done without general anesthesia, and during them the girl became more or less excited, in which excitement the ball protruded distinctly, although not to the extent it did before the tumor was removed.

The protrusion of the globe during excitement is due, in part, I believe, to the lack of muscle support and the defects in the orbital walls. The pulsations which have been noted from time to time were transmitted, I am sure, from the ophthalmic vein, which is in all probability of greater caliber than normal. At the time of the removal of the mass there was no pulsation felt in the apex of the orbit when my fingers came in contact with the optic nerve and other tissues. At present I cannot find signs of vascular disease such as would justify me to regard the case to be one of pulsating exophthalmos rather than angioma of the orbit.

At the last of April little masses of conjunctival granulations had formed. These were snipped off, and the tissues over the outer aspect of the globe were gathered into the grasp of a crutch-shaped forceps and the inclined portion abscissed. The free edges were then united by three sutures, in the same manner as that which I have pursued in several cases of old divergence after complete tenotomy years previously, in which a conjunctivocapsular advancement has effected parallelism.

My thanks are due to all who have shown an interest in this quite extraordinary case, but especially to my resident surgeons, to Dr. Brinkerhoff and to Dr. Schwenk, as well as to the fellows of the Section on Ophthalmology of the College of Physicians, for their kindly suggestions when I showed the young woman at the January meeting of that section.

XXXIV.

THE TREATMENT OF TRACHOMA WITH BULGARIAN BACILLUS CULTURE.*

J. P. Crawford, M. D.,

Nashville.

I shall not detain you long with this paper, as the most of you have probably seen my paper published in the *State Journal* last year.

I am very much pleased, through the kindness of Mr. Armstrong, the superintendent of the Tennessee School for the Blind, to be able to present some of the cases to you today. The cases here speak for themselves and leave little to be added by me.

In the past two years I have treated twenty cases of trachoma in the school and one private case, all in the second and third stages of the disease. Nine of the cases shown here have had no treatment with the B.B. culture since early last spring, and none of them show any tendency to relapse. Of the other six cases presented here, four entered the school in September, 1916. The other two cases were treated last year, and were of the large shelving or overhanging variety, and at the close of the school both cases were markedly improved. They probably should have been given the treatment to use at home, but I was anxious to see what their condition would be when they returned in September, 1916, and therefore did not give them any treatment to use during the summer. That is a period extending from June 1 to September 1, 1916. They both reported that they had had very little inconvenience, and to all appearances there was very little change in their condition. On their return we began the B.B. culture twice a day. The condition began slowly to improve, but not as rapidly as the new cases, and about the middle of January I everted the lids of the little boy pointed out to you, and opened a few of the granules and squeezed their contents out with the Knapp roller forceps, being careful to do as little trauma as possible, and only with the view of facilitating the entrance of the bacilli into the diseased tissues. I then ordered the B.B. culture to be continued twice a day. The boy began at once to improve, with the results you see today. In the case of the girl, his sister, the granules were opened and contents squeezed out about February 20, 1917. The B.B. culture was continued as in the other case. Both of these cases showed rapid improvement after the partial expulsion, and neither of them missed a single class or any other of their duties at the school.

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*Read before Section on Ophthalmology and Otolaryngology at annual meeting of Tennessee State Medical Association at Nashville, April, 1917.

The four cases that I am unable to show you are no longer in the school, and I have been unable to get in touch with them, as they all live out of the city. However, two of the cases were considered cured last year, and we had not been using the culture for some time before they went home. The other two cases, while not entirely well, gave every promise of an ultimate cure, if the treatment could have been continued. The private case was improving under treatment, but I am unable to report further on him, as he, too, took "French leave."

The first thing to be considered and to strive for in any line of treatment is to preserve as much of the normal tissue as possible. With this end in view, it becomes our duty to our patient to avoid any operative work, unless we can thereby very much shorten the course of the treatment and not materially add to the scar tissue and other sequelæ, which we necessarily get in all the trachoma cases. In my experience, the B.B. culture will cure the vast majority of these cases and with less scar tissue. But where the granules are large and numerous and do not readily yield to the treatment, the granules should be opened and their contents squeezed out. Then continue the B.B. culture, and you will materially shorten the course of the disease, without adding much by the operation to the sequelæ.

In all cases I have the patient bathe the eyes several times a day in hot water. As the case improves I use the culture once a day. After the granules disappear, the conjunctiva will have a velvety appearance. I then discontinue the B.B.

culture and use a ten per cent solution of the other albuminous silver salts, once a water and add saturated solution of boraci a day. In case of cloudy cornea or pannus tion, one drop every other night. In no c should use the Knapp roller forceps, as we l tomed to do in these cases. In fact, I think as good results by using an ordinary pair to expel the contents, in case we did not hav

There is another feature which we mus and that is the simplicity of the treatment, dom from pain. Our patients will no long ment, as heretofore, and rather suffer fro undergo the more severe treatment. I do any greater danger from iritis with the u than in any other line of treatment, and whil cases of iritis, atropin and the usual remedie ly controlled it, and I have only used a cated. I have had no experience with the l though it is claimed that the bacilli are mor medium. My results have been so satisfact the powder, I have been quite content to h try out the liquid culture.

I do not hesitate to advise that the genera especially those living in the rural districts treatment, taking the precautions as outlin paper. While I am not yet ready to make is a specific for this disease, yet when we has not been a single failure out of the forty it is, to say the least, significant and not bey ties. I know of no socalled specific for wh any better record thus far. The scar tissue will preclude any doubt or question of the di the cases shown.

Now, in conclusion, Mr. Chairman and g I have been able to demonstrate here by th the endorsement of this section, you will gi an impetus that no single individual would universal adoption by the profession, we will, lieve, conquer a disease that has baffled the sk profession throughout all the ages.

XXXV.

INFLAMMATION OF THE CONJUNCTIVA RESEMBLING TRACHOMA.*

C. J. Broyles, M. D.,

Johnson City, Tenn.

The only diseases affecting the conjunctiva that resemble trachoma to any important degree are the follicular, vernal, phlyctenular, and chronic catarrhal forms of conjunctivitis; and in some of these the resemblance is remote.

Of these, the most important is folliculosis, sometimes called follicular trachoma. This is probably the most frequent or common of all eye diseases, and appears to develop in children possessing what might be termed the adenoid habit. It is distinguished from trachoma by the roundish, transparent or yellowish, well defined bodies of smaller size, systematically arranged in rows, with a tendency to remain discrete, which are always larger and better defined in the lower fornix. It is not confined to the homes of the poor, or to those with unhygienic surroundings, but is found, probably as frequently, in the children of the well-to-do; and in the country, with its air and sunshine, as in the city; and sex and age seem to have no influence on its development, aside from the conceded truth that it is regarded as an expression of glandular enlargement, more apt to occur in childhood and youth.

Some authors claim that it may be caused by the prolonged use of eserin, or by impure solutions of atropin, or by the use of dry atropin. Such an influence has not been claimed for these drugs in the production of trachoma. It is said to arise from so varied a list of excitants that it might be termed, not a distinct entity, but only a symptom.

Complete cure is to be expected, though it is very persistent and rebellious to treatment. But the tendency is to final recovery, even without treatment, and that without sequelæ of

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***Read before Section on Ophthalmology and Otolaryngology at annual meeting of Tennessee State Medical Association at Nashville, April, 1917.**

any kind. This is where folliculosis is
guished from trachoma, which is freque
it; in that the latter always leads to perma
changes in the conjunctiva, if left unhinde
lid, so characteristic of trachoma, is not se
Various drugs and procedures have been
cure of this rebellious malady. Generally,
silver nitrate solutions, boric acid, coppe
crayon, the roller forceps, and, finally, gratt
probably giving the most promise.

Some authors claim that complications
true trachoma and pannus may develop, b
independent infection and not a sequel.

This disorder is greatly aggravated by
fractive errors should be corrected. This a
cases of refractive errors, however.

Vernal conjunctivitis is a rare disease,
experience seeing it infrequently, but everyo
allotment of cases. It is characterized by
in the conjunctiva, appearing more frequen
in the young; hypertrophy of the conjuncti
corneal margin, with a formation of granul
acter, in the palpebral conjunctiva. The
knowledge of the cause of this disease—wh
of specific germ origin.

There is generally a slight ptosis, giving
indifferent look. Lesions may occur in th
bral regions, or both. While the disease is
ern countries, it may extend far into the
among all classes of society, and in persons
is uninfluenced by sunlight, and is not con
sporadically. The most characteristic sympt
itching, and it persists for weeks. It is m
effort to gain relief by the constant rubbin
the swelling, and the eyelids can be kept o
effort. This symptom lasts as long as wa
like hay fever, subsides when the temperatu
perate degree—say, 60° or 65°, Fahrenhei
summer or winter; relief even being exper
tient enters a cave or cold storage room. Th

toms are the same, summer and winter, but the subjective disappear in the cool season. The granulations are pedunculated with fissure-like demarcations, consisting of fleshy fat growths on the surface, bluish white or bluish pink in color. They never ulcerate and pannus seldom occurs, and corneal ulcers are rare indeed. The disease heals, leaving no trace, nor any of the structures involved.

Most of the medicinal remedies that are used with benefit in true granular conjunctivitis, such as copper sulphate, silver nitrate, and various mercurial preparations, are without influence, or may even be positively harmful. Medical treatment, either local or general, has proven to be unsatisfactory and disappointing. Ichthyol, followed by chinosol, is recommended for giving relief to the intolerable itching. . Various remedies are suggested, but are disappointing. In the tarsal type, fortunately by far the most frequent, surgery offers the most hope. In my limited experience grattage has always been done, and cure has been the invariable result.

In the phlyctenular form of conjunctivitis, one or many grayish elevations appear on the bulbar cunjunctiva, near or about the corneal limbus, each appearing to be the center of an area of its own, tiny vessels radiating in all directions from it as a center. These soon break down, becoming shallow, grayish ulcers. They may extend to the tarsal conjunctiva, but are usually confined to the bulbar portion; and often the cornea is involved, the disease becoming dangerous in direct ratio to the extent of its implication. This is generally found in children from infancy through pubescence, though it may appear or continue in later life, more frequently in girls.

Authors generally distinguish between the corneal and the conjunctival form, but this appears to be an unnecessary and a superfluous distinction, as the same is said of each, even to the medical treatment, with the addition of atropin in the corneal form.

It is thought to be of constitutional derivation, and its victims are frequently of the socalled diathesis, the tuberculous or the poorly nourished.

Like all diseases to which the eye is heir, this is influenced by unhygienic surroundings, and to an unusual degree by unwholesome diet that may bring about an intestinal disturbance. It is regarded by some authors as an ocular manifestation of eczema. It is certain that a large proportion of cases are accompanied, preceded or succeeded by this affection.

The vesicular diseases of the eye are commonly found in company with adenitis, lesions of bones and joints, consumption, otorrhea, dactylis, rhinitis is almost always present, and adenoids are frequently associated with them. There is pain and blepharospasm; photophobia is extreme, and lacrimation is exaggerated. It is easily influenced by proper treatment, though there are rather infrequent cases that are tedious, or even intractable. If the cornea is deeply involved, scars will surely be left, generally nebulous in degree and character.

The treatment should, because of the systemic disturbance, be largely directed to the general system and hygienic corrections and adjustments. Of course, employing a proper local medication, the chief of which is atropin and cleansing irrigations, and a carefully prepared yellow oxid salve, after the vesicles break down.

That chronic catarrhal conjunctivitis, with its chain of subjective symptoms, could frequently be mistaken for trachoma, seems impossible. Its chief symptoms are subjective, and include burning, itching, sandy feeling, dry sensation, blurring of vision, and so on. It is not partial to youth, but is fond of the mature and aged. When it advances beyond the subjective stage, and the lids and fornices, or both, become red and hyperemic, and the membrane is thickened and blepharitis marginalis is present, or when an eczematous condition is present, and finally ectropion and corneal ulcers develop, then is the time for the inexperienced or the careless observer to err.

These diseases may frequently assume the likeness of trachoma; but if their characteristics be carefully compared; if the round, opaque, ill-defined bodies, peculiar, dirty, grayish color; if the excessive friability, feeling like semi-browned albumin; their tendency to become confluent; their preference for the upper lid; the droop of the upper lid; pannus and corneal ulcers; the structural changes in the conjunctiva which are always present; the involution of the tarsus; the universality of ages attacked; and, finally, the distorted lids and conjunctival atrophy be well considered, confusion will seldom occur.

XXXVI.

TRANSITORY HYPEROPIA IN DIABETES.*

FREDERICK A. KIEHLE, M. D.,

PORTLAND.

The ocular stigmata in diabetes are varied and manifold. Retinitis, retrobulbar neuritis, optic atrophy, cataract, iritis, amblyopia with organic changes, are all associated with the condition. It is also well known that the refraction may be greatly increased or greatly decreased with glycosuria. Van Noorden, in two hundred and fifty-nine cases of ocular involvement complicating diabetes, found diabetic myopia to be present in twenty-one. This proportion (slightly over twelve per cent) is probably a fair one. The development of sudden, often transitory, hyperopia in this condition is much less frequent. The American Encyclopaedia of Ophthalmology (p. 3029) quotes thirteen cases. Wescott and Ellis give detail of these thirteen and of eight others, including four cases that had come under their own observation.. To these I have to add from my own practice one case which comprises, I believe, unique features.

The general acceptance of the principles involved in what is now known as the "Allen treatment" has largely transformed the handling of diabetes. With the general plan of this procedure you are familiar, and I shall not burden you with a recital of its details further than to remind you that it has grown out of the suggestions first offered by Dr. Frederick M. Allen of the Hospital of the Rockefeller Institute for Medical Research, New York, in a paper read before the Association of American Physicians at Washington, District of Columbia, in May, 1915. Therein he enunciated the new principle in dealing with diabetes, that increased weight or increased metabolism increases the strain upc creatic function, and, vice versa, that the s the reduction of weight and metabolism. policy of insisting upon prompt and lasti glycosuria and acidosis (diacetic acid in the severest cases of diabetes. "This all,' poses the old idea that the diabetic be kept sible level of strength and weight, and tha synonymous with improvement." He alsc trine that fat-feeding does not influence g calories lost in the urine should be repl calories in the diet, "preferably in the forn

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*Read before the Pacific Coast Oto-Ophthalmic Society, June 18, 1917, Spokane, Washington.

He proceeds with the initial fast of one than sufficient to clear up the glycosuria a nently, with as many fast days interspers necessary for the purpose. The details o scription have been modified by later practi

Results as observed have been most bene the accepted treatment, as patients seem inv when glycosuria and acidosis are removed t allowed to continue. In a word, the "Alle be summed up thus: "Fast until sugar-fr ually work up the diet."

The patient in question (T. B., aged thi sulted me on the 29th of last November, ability to see distinctly either at close rang Coincident with this development there a increase in the appetite. He had returned border about three weeks previous. Ther dipsia. The patient was a physician, a man intelligence, and he was confident that his e been as normal as the average. He had sulted an oculist, and I am unable to state w had been. He had noticed his own dilated if they might be the result of atropin that istered to him at four hour intervals for thr attack of actue tonsillitis and quinsy two we

The examination of the eyes showed the a normal in color and appearance, pupils equ about seven millimeters diameter and rea faintly to light and accommodation. Media clear, except that the left lens at the inferior external quadrant showed an area of cloudiness. Careful examination of the fundi failed to reveal any abnormality. External ocular movements indicated no pareses, but the Maddox rod showed an esophoria of 14° at six meters and of 12° at one meter distance. Vision in the two eyes was identical—viz., 6/60, and no Jaeger type could be read. By the aid of a + 1.50 sph. $\overset{\frown}{\smile}$ + 0.50 cyl. ax. 90° (which correction agreed with the retinoscopy) 6/6 was read with each eye. With + 4.0 sph. + 0.50 cyl. ax. 90° (i. e., an addition of + 2.50 sph.) Jaeger 1 was read at fifteen inches. The patient had discovered sugar in his own urine, and I referred him to Dr. W. S. Knox, who placed him at once upon the socalled Allen treatment. In three days the glycosuria had entirely disappeared.

The patient was somewhat difficult to "round up," and it was not until December 20th (three weeks after the first examination) that I succeeded in making the second observation. At this time he reported that for at least five days previous his eyesight had been, as far as he could tell, perfectly normal. He now had 6/6 vision in each eye, with no manifest hyperopia, and read unaided Jaeger 1 at sixteen inches with the right, and fourteen inches with the left eye. There was still present one and one-half degrees of esophoria, the same amount being present for distance and for near. A cycloplegic mydriatic was not used on the first examination, for the reason that the pupils were widely dilated and the amount of accommodation remaining seemed to be negligible.

I regret that subsequent examination has been made impossible by the patient being called to military duty. The patient is adhering to dietary regulations and continues to be sugar-free and in good general condition. I am convinced that this is a true case of transitory hyperopia of considerable degree, due to diabetes, involving also paralysis of the accommodative apparatus. The esophoria I would believe to be accounted for by a hyperstimulation of the third nerve, in the effort to force ciliary activity, the overflow passing to the muscles of convergence.

The explanation of refractive changes occurring during the course of diabetes has been widely sought and variously stated.

Wescott and Ellis in their article give an excellent résumé of the different theories that have been suggested. Some are on the basis of an alteration in the refractive indices of the media, cornea, aqueous, lens and vitreous, by reason of the presence of sugar in the lymphatic circulation of the eye. Some, on the theory that a loss of fluid in diabetes reduces the volume of the globe. No explanation is wholly acceptable.

It should not be necessary to remind men of broad medical training of the importance of urinalysis. Whatever good intention there may be, this is too frequently overlooked as a factor in ocular conditions. It is manifestly impossible and even unnecessary to examine the urine as a routine in all cases, but the danger is that thus it is overlooked in most cases where indication is less apparent. I am confident that the condition of diabetes mellitus in early stages is frequently passed by, and that many of our obscure cases will be cleared up by the discovery of sugar in the urine.

Though not wholly germane to my subject, I may add that while working on the final draft of this paper two patients who came to me with rather perplexing objective symptoms were discovered to be diabetic, much to their surprise, but also to their satisfaction that their condition could be taken in hand in its incipiency.

In both these cases, also, prompt treatment by the internist, following the starvation method of Allen, brought about early freedom from sugar and complete relief of the ocular symptoms.

The desirability of watching closely this and other early ocular changes incident to diabetes in the light of modern treatment should be emphasized.

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XXXVII.

COCAIN KERATITIS.*

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It is not assumed that cocain alone is the cause of keratitis, but it is thought that it opens the door to germ activity because of its action upon the protecting epithelium. The first effect of the drug, when instilled in the eye, is a marked constriction of the blood vessels and a drying of the superficial epithelial layer of the cornea. This last effect is evident to anyone who has performed operations upon the eye with a local anesthetic. The desiccating effect is increased by the fact that the act of winking is reduced in frequency as a result of the anesthetic effect, and in case of operation the speculum eliminates the natural moistening effect of the lids. There are probably more cases of ill effects from the local use of cocain than we realize; keratitis is the rarest of the results, but the "watery eye" due to overuse of cocain, by women especially, to relieve the burning and itching of chronic conjunctivitis or the edematous conjunctivitis which occurs in those subject to the vascular changes which culminate in giant urticaria, is the most common. Plethoric individuals sensitive to certain kinds of food, like clams or crabs, after having overeaten for years, arrive at the climacteric with swollen and edematous conjunctivæ, associated with great itching and burning, and they may, also, have attacks of urticaria, giant urticaria or lesser forms of Raynaud's disease.

These patients seem not to use the drug for its physiologic effect, but demand it for local relief. Too many practitioners see in cocain something which will give this relief, and while there can be no objection to its temporary use, the psychic side of the individual should be considered. Conditions underlying these local symptoms are not to be relieved in a short time, and it would seem a good rule to avoid habit forming drugs, if possible, in cases of hypersensitives like those mentioned.

To be sure, the physician will occasionally lose his patient to a less scrupulous individual or succession of other physicians, as the case may be, but he will have the satisfaction of doing what he thinks is right and not what is expedient. The pandemic of narcotic legislation has made it more difficult for the patient to purchase cocain without a prescription, but the habitue will demand the remedy if he feels it is going to afford the relief he seeks.

Taking into account the whole number of eye patients, the cases of use and abuse of cocain may not figure out to be numerous, but they should be fewer than they are. It is the consensus of opinion of a number of oculists of wide experience that the local use of cocain by the patient is rarely necessary. After the removal of foreign bodies from the cornea, cold applications and occasionally atropin will take its place. After trauma, the same cold applications usually give relief, although heat seems best sometimes. Cocain is not in place in iritis, and infected conjunctivitis requires the proper antiseptic and not cocain.

The patient not obtaining relief from the usual reliable methods belongs, not infrequently, in the class of "hypersensitives." There seems to be something lacking in the lives of these patients, and that is something which will absorb their interest, attention and efforts. David Harum claims to have found a use for the flea along these lines, but entirely within canine rights and privileges. He says, "a certain amount of fleas are good for a dog, because they keep him from worrying about being a dog."

There is sometimes in medicine an opportunity to do the right thing by doing less and not more for the patient. The difficult thing is to get the patient to agree with the program.

Mrs. R. calls for relief from "pink eye." Both eyes have most prominent and tortuous vessels in the ocular conjunctiva. There is a moderate mucopurulent discharge, and the patient complains of pain much more than one would expect, if guided by the local appearances. The upper lids have a little "velvet" on each, and there is a superficial cloud over the pupil in the left cornea. The vision of the right eye is 15/40, which with a + 1.00 ax. 90° becomes 15/15. The vision of the left eye is 15/200, which can be improved to 15/70 with + 2.00 ax. 90°, although retinoscopy decrees that + 1.00 ax. 90° should be sufficient. No prescription for a glass was made, of course, at this time. A few applications of bichlorid of mercury, 1/1,000, removed the "velvet" from the upper lids, and a bacteriologic examination revealed the presence of diplobacillus which the examiner said was either the Morax-Axenfeld or the Koch-Weeks organism, probably the former. Some will object to this kind of a bacteriologic report, and with them I will agree, but it resulted from a misunderstanding as to what was wanted—a culture examination or a smear. Assuming the organism to be the first of the two mentioned above, zinc sulphate solution, one-half per cent, was prescribed with good results, and in a week the corneal blur had cleared and the vision of the left eye with + 1.00 ax. 90° was 15/15. The patient asked permission to use cocain occasionally, and was told that the less of it she used the better the eye would be. A one per cent solution had been prescribed for her by her physician, and she insisted that she could not do without it. When seen last she was in excellent condition and not using the drug, according to her statement, and her eyes looked as if the statement was true.

Some time passed and I was called to the house to see the patient, and found a crescentic ulcer of the right cornea, located down and in, extending about one-half the height of the cornea. Both ocular conjunctivæ were red and swollen and the blood vessels tortuous and prominent. There was a moderate mucopurulent discharge from each eye. She complained a great deal of pain, and demanded something for its relief. The occasional use of cocain was admitted, but I could not ascertain how much was in use. The patient had been using the zinc from the previous attack, but it did no good this time. A culture showed the presence of a pure strain of staphylococcus albus. The color of the ulcer was a peculiar yellowish white. The eye was cocainized and the ulcer treated with pure carbolic acid. Usually one can clean up an ulcer with a swab, but this superficial slough was most tenacious and would not be removed. The ulcer was superficial, and each treatment of it with pure carbolic acid resulted in extension to deeper layers. After cauterizing the ulcer for three successive days without improvement, it had come to cover a little less than one-half the cornea. Much against the wishes of the patient a nurse was installed in order to find out what was being done in the way of local treatment, as we could get no exact information any other way. The nurse's stay was short, and before she could be of service she was discharged by the brother because of a complaint of the patient. Argyrol, twenty-five per cent solution, was instilled every two hours, and seemed to have a fairly good effect, but the progress of the ulcer continued. After further loss of time in useless talk another nurse was installed, who ascertained that in one fourteen hours a half ounce of four per cent cocain had been used, although the patient complained that some was spilled. It was her habit to inject several drops in each eye whenever she felt pain.

With this large ulcer there was never a sign of hypopyon. This was indeed strange, if we consider its size, appearance and the severity of the inflammation. The pupillary area of the affected eye was filmed over with fine threads of exudate, and adhesions formed in spite of the liberal use of atropin, which seemed to have no influence whatever. As soon as the cause was found the use of the drug was discontinued and there was immediately a steady improvement. The ulcer ceased to spread, but improved more under argyrol than under the local use of boracic acid. Argyrol is said to be a chemical antidote to cocain, and it is probable that it helped to reduce the ill effects of cocain chemically as well as through its germ destroying influence.

The patient had been able to obtain cocain, but the physician had increased the strength of his prescription from one per cent to four per cent, in response to the pleadings of the patient.

The remarkable features of the case are the marked engorgement of the conjunctival vessels, the superficialness of the ulcer, the yellow white color of the ulcer prior to the use of argyrol, the tenacious upper layer of the ulcer, and the thin scar which resulted, which is so thin one can hardly believe there has ever been an ulcer there.

It would seem a good rule to stop and take "stock" if we find cauterizing an ulcer with pure carbolic acid or heat does not succeed in a reasonable length of time. (Heat has never succeeded with me if the carbolic failed.) The presence of a germ does not eliminate a "cause," which should be sought.

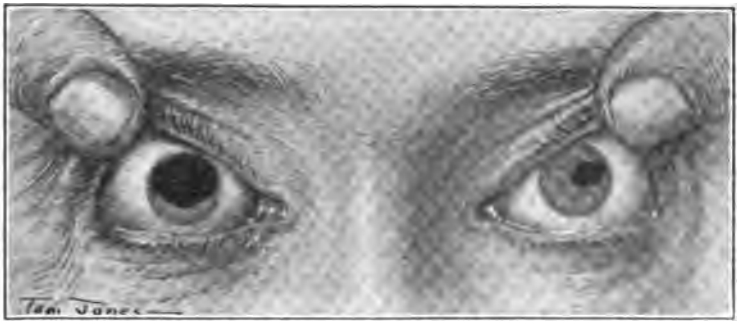
XXXVIII.

A CASE OF HEREDITARY BILATERAL UPWARD COLOBOMA OF THE IRIS, WITH REMARKS ON HEREDITARY BLINDNESS.*

Clarence Loeb, M. D.,

Chicago.

Cases of congenital malformation of the eye are always interesting, even though we can usually do very little for them from a therapeutic standpoint. They become much more interesting when they are of an unusual type and are, in addition, hereditary.



Although coloboma of the iris cannot justly be classed among the very rare ocular manifestations, it is not seen so frequently by any one man as not to excite interest. When it is bilateral and unaccompanied by any other developmental lesions it is of additional interest. But when the lesion has an atypical location, and, furthermore, a definite hereditary history running through five generations can be obtained, it certainly becomes worthy of being put on record.

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*Read before the Chicago Ophthalmological Society, October 15, 1917.

Miss Z., a graduate nurse, was referred to me in January, 1917, for examination. I found that she had a bilateral coloboma, as shown in the drawing which Mr. Tom Jones was kind enough to make for me. In the right eye the defect is much greater than in the left. The remaining portion of the iris starts just above the horizontal meridian, temporal side, curves downward and then upward to a point on the nasal side slightly above that on the temporal. By transillumination, and looking far to the side, the margins of the lens can be seen in the area where the iris is absent, but the ciliary body cannot be seen. Moreover, the fundus is absolutely normal.

In the left eye the pupil is extended upward and temporally by the coloboma almost to the periphery, in a position corresponding to about two o'clock. A thin edge of iris persists at this location. In this eye, also, there is no lesion of the fundus.

The right eye is almost amaurotic, owing to a high degree of myopic astigmatism, while the vision in the left eye is quite good after correction of a small amount of myopic astigmatism.

The patient was a very intelligent woman and repeatedly assured me that wherever the anomaly had appeared in her family, it had partaken of the same character as in her eyes—namely, bilateral, upwards, and more pronounced on the right than on the left. At my request she obtained the following family history:

I. Male—affected, two sons.
II. (a) Male—affected, three children.
  (b) Male—affected, six children.
III. Children of II (a):
  (a) Sex unknown—affected, one child.
  (b) Sex unknown—not affected, no child.
  (c) Sex unknown—not affected, no child.
 Children of II (b):
  (d) Male—affected, six children.
  (e) Male—affected, no children.
  (f) Female—affected, one child.
  (g) Female—affected, one child.
  (h) Female—not affected, no child.
  (i) Female—not affected, no child.

IV. Children of III (a):
    (a) Sex unknown—not affected, no children.
  Children of III (d):
    (b) Female—not affected, one child.
    (c) Male—not affected, no child.
    (d) Female—not affected, two children.
    (e) Patient—affected, no children.
    (f) Female, affected, no child.
    (g) Male—not affected, no child.
  Children of III (f):
    (h) Male—affected, no children.
  Children of III (g):
    (i) Female—not affected, one child.
V. Children of IV (b):
    (a) Male—not affected.
  Children of IV (d):
    (b) Male—not affected.
    (c) Male—not affected.
  Children of IV (i):
    (d) Male—affected.

In this family, therefore, we have instances of both direct and indirect heredity. Counting each affected parent and his children, whether affected or not, as a separate family, we have seven families containing twenty children, of whom ten, or fifty per cent, were affected. There are two families in which the parents were not affected and the children likewise normal. Finally, there was a case of indirect heredity of one child through an unaffected mother.

In an investigation into the subject of hereditary diseases of the eye, which I made in 1908, I was able to collect the histories of fifty-nine families of aniridia or coloboma of the iris. Out of one hundred and fifty-six children, one hundred and sixteen, or seventy-four per cent, were affected. This is a higher percentage than obtains in the family whose history I have just related. In addition, a search through the literature since 1908 revealed the following cases:

Snell[1]—
I. (a) Male—normal, no children.
    (b) Male—normal, no children.

- (c) Female—affected, three children.
- (d) Male—normal, no children.
- (e) Female—affected, no children.

II. Children of I (c):
- (a) Male—normal, no children.
- (b) Male—normal, no children.
- (c) Female—affected, six children.

III. Children of II (c):
- (a) Male—affected, six children.
- (b) Male—affected, no children.
- (c) Male—affected, four children.
- (d) Female—affected, one child.
- (e) Female—normal, three children.
- (f) Female—normal, six children.

IV. Children of III (a):
- (a) Female—affected, no children.
- (b) Male—affected, one child.
- (c) Male—affected, one child.
- (d) Female—normal, four children.
- (e) Male—normal, one child.
- (f) Male—normal, no children.

Children of III (c):
- (g) Male—normal, no children.
- (h) Female—affected, no children.
- (i) Male—affected, no children.
- (j) Male—affected, no children.

Children of III (d):
- (k) Male—Normal, no children.

Children of III (e):
- (l), (m), (n) Males—normal, no children.

Children of III (f): All normal.

V. Children of IV (b):
- (a) Female—affected, no children.

Children of IV (c):
- (b) Female—normal.

Children of IV (d):
- (c), (d), (e), (f): All normal.

Children of IV (e):
- (g) Male—normal.

If we count every affected parent with his or her children as a separate family, we have seven families showing direct heredity. In these families there were twenty-two children, of whom twelve were affected and ten normal. In addition, we have one family showing collateral heredity, five children, two affected, three not.

Polte[2]—

I. Female—aniridia, cataract, ectopia lentis and nystagmus, two children.
II. (a) Male affected.
  (b) Male affected.
  One family, two children, both affected.

Shannon[3]—

I. Father—coloboma iris, five children, four affected, one not. One brother of father affected, two brothers and one sister not affected.

White[4]—

I. Female—cataract—children (?)
II. Female—cataract and coloboma iris—children (?).
III. (a) Male—cataract, ectopia lentis and aniridia, children (?).
  (b) Female—cataract, ectopia lentis and aniridia—one child.
IV. Children of III (b): (a) Aniridia and cataract—children (?).

This history cannot be used statistically.

Ring[5]—

I. Female—coloboma iris—children (?).
II. (a) ?—coloboma iris—children (?).
  (b) ?—notching iris—children (?).
  (c) ? — ? — children (?).

This history cannot be used statistically.

Laserew and Petrow[6]—

I. Male—aniridia, one child.
II. Female—aniridia.
  One family, one child affected.

Hessin[7]—

Parents normal, ten children, five affected, five not.

This is a case of collateral heredity and cannot be used in these statistics.

The above gives us the statistics, therefore, of ten families containing thirty children, of whom nineteen were affected and eleven not affected. If to these are added the families and children in the case just reported by me, we have a total of seventeen families, containing fifty children, of whom twenty-nine were affected and twenty-one not affected.

If the present number of families and children are added to the previous statistics, we have seventy-six families with a total of two hundred and six children, of whom seventy per cent were affected. It is thus seen that the anomalies of the iris are strongly dominant characteristics tending to be inherited in about three-fourths of the children of a parent so affected. So far as I know, there has been no case recorded of the marriage of two parents with coloboma of the iris. Consequently, no statement can be made as to the effect of such a marriage upon the progeny. In cataract, however, the percentage was sixty per cent in the case of both parents affected, and fifty-eight per cent in the case of only one—practically the same. In retinitis pigmentosa the percentage is fifty per cent in the case of both parents affected, and 50.6 per cent in the case of only one—again practically the same. However, the number of families in both of these diseases where both parents were affected is so small that no definite judgment should be made. According to the Mendelian law, the percentage should be sixty-five per cent affected and twenty-five per cent unaffected, if the anomalous condition is regarded as the dominant and the normal as the recessive characteristic; or vice versa, if the normal is the dominant and the abnormal the recessive. However, in applying the Mendelian law, it seems to me we must remember one fact, viz., that it was worked out for plants, which produce several seeds at one time and under the same circumstances. It might and probably does apply to those animals which produce two or more young at a birth. But it seems to me to be a question whether we can apply the law to the human animal, where the rule is one offspring at a birth, and where at least nine months elapse between births. We do not know what proportions of egg cells or spermatozoa are capable of transmitting the taint, nor do we know what chance there is of a normal egg being fertilized by an abnormal spermatozoon. Therefore, it seems to me that we cannot predict the condition of the offspring's eye according to the Mendelian law, but must base our prediction on the law of probabilities as revealed by the collection of as large a number of cases as possible. Until that has been done, no exact law can be formulated, and I do not feel that the number I have succeeded in collecting is large enough for this. However, I do feel that it is large enough to permit the unqualified statement that marriages where one or both parties are affected with certain forms of eye disease—viz., albinism, aniridia and coloboma iridis, anophthalmus and microphthalmus, atrophia nervi optici, cataract, ectopia lentis, family degeneration of the cornea, glaucoma, megalophthalmus, nystagmus, ophthalmoplegia and ptosis, or retinitis pigmentosa, are fraught with great dangers to the children born of such marriages. Furthermore, there is danger, although probably not so great, where the parents themselves are unaffected, but where one or both families are tainted by the presence of the disease in an ancestor or collateral relation.

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XXXIX.

THE TREATMENT OF VITREOUS OPACITIES.*

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The Vitreous Body.—The greater part of the interior of the eyeball is occupied by the vitreous body, which is situated between the lens and ciliary body anteriorly and the internal limiting membrane of the retina posteriorly. It is composed of a jelly-like substance, perfectly transparent, called the vitreous humor, invested with a delicate capsule known as the hyaloid membrane. The vitreous humor consists mostly of water with a few corpuscular elements and a small percentage of carbonate and chlorid of sodium, giving it an alkaline reaction. It has a depression anteriorly, on which the lens rests, known as the fossa lenticularis, and a lymph space extending from the optic disc to the capsule of the lens. This is the canalis hyaloideus, its enlargement in front of the disc is the "area Martegiani," and behind the lens constitutes the "postlenticular space." It is a lymph space and communicates with the anterior chamber and with the intervaginal spaces of the optic nerve. In fetal life it is occupied by the hyaloid artery, which sometimes persists in the adult.

Causes of Opacities in the Vitreous Body.—Among the commoner causes of opacities in the vitreous may be mentioned the following: Choroiditis, iridochoroiditis, cyclitis, iridocyclitis, intraocular hemorrhages, injuries, myopia, retinitis, uveitis, anemia, loss of sleep, gout, syphilis, menstrual disorders, constipation, portal congestion, malaria, long continued use of arsenic, senility, elderly persons with atheromatous arteries, hemorrhages after severe strains, excessive use of stimulants, leukemia, emphysema, dysentery, cholera (all varieties), metastatic choroiditis following puerperal fever, exanthematous diseases, influenza, microbic invasion from old operative wounds, tuberculosis, nasal accessory sinus disease, animal parasites, idiopathic inflammation, detachment of the vitreous, fatty degeneration of the vitreous and cholesterin crystals in the vitreous. Cataracts and glaucoma are frequently complicated by opacities in the vitreous.

The diagnosis of opacities in the vitreous is a very important matter, as the vision may be entirely lost in patients who neglect to seek relief. These cases should be referred to the specialist promptly, as it is only possible to detect this condition, and many of the underlying diseases of the ocular structures which causes it, by the most careful and painstaking ophthalmologic examination. The opacities are of two varieties, fixed and floating, and present every conceivable size and shape, and when viewed by the ophthalmoscope appear as dark objects against the fundus, resembling soft coal soot or black moss. These masses when fixed in the line of vision constitute a serious obstacle to vision, while if situated to one side may not disturb the patient very much. I have found, however, that when the opacities are floating about with every movement of the eye, the patients are greatly alarmed in some cases and in others much annoyed.

Various devices are resorted to in order to see them, such as the plane or concave mirror, strong or weak lenses, according to the depth of the opacity, and strong or weak light in certain cases will render them visible; also varying the distance from the observer to the patient will bring all the different parts of the vitreous into view, if the vitreous is otherwise transparent. There are sometimes a few leucocytes in the vitreous which cause entopic phenomena, but are not discoverable with the ophthalmoscope. Foreign bodies in the eye, which it may or may not be possible to locate with the X-ray, I shall not stop to consider, as it would take more time to consider that one phase of the subject than is available for this paper. Sometimes the vitreous is so full of fine opacities that it is impossible to see the fundus. The view may be further interfered with by pathologic conditions anterior to the vitreous in the lens, aqueous or cornea, or posteriorly by pus, tumors or exudates.

Treatment.—All patients presenting themselves with opacities of the vitreous should be thoroughly refracted, preferably under atropin, unless there is some special contraindication, to discover if there is any error; if so, its nature and extent. Frequently there will be found serious defects which have existed for a long time and were unsuspected by them. The most serious form of ametropia in relation to hyalitis is myopia of high degree, and myopic astigmatism, causing posterior staphyloma and myopic choroiditis and fluidity of the vitreous. These patients should be accurately fitted for near and distant vision, and cautioned to avoid overuse of the eyes, as they are in imminent danger of detachment of the retina. These cases of synchysis greatly complicate the extraction of cataract. All these cases should not only have their errors of refraction corrected for near and far, as indicated, but should have ultra violet ray protection for the retina, if exposed very much to the bright sunlight or tungsten or nitrogen electric lights.

Hemorrhages into the vitreous result from traumatism or bleeding from the ciliary body, retina or choroid, as the result of diseased conditions, the blood penetrating the hyaloid membrane and mixing with the vitreous humor to a greater or less extent, depending on the amount of hemorrhage and the consistency of the vitreous. These extravasations of blood frequently occur at the time of puberty, adolescence, menopause and during senility with atheromatous conditions of the arteries. I have seen them occur in all these instances, as well as in nephritis, diabetes, syphilis, and anemia, the latter frequently also meaning a condition of lessened coagulability, the same as we often encounter in anemic conditions accompanying diseased tonsils and adenoids, where, upon their removal, hemorrhage continues for a long time, without the slightest tendency to clot, instead of the normal period of three to five minutes.

The patient should be placed in bed, when practicable, and given morphin to reduce the blood pressure (avoiding adrenalin). Salines in laxative doses given for a long time, so as to avoid any necessity for straining. The eyes protected from light and any unnecessary use. The blood should be thoroughly examined and Blaud's carbonate of iron pills given when indicated, and active antiluetic treatment instituted when justified by the clinical or laboratory findings. Iodid of potassium meets the double indication of increased pressure and absorption of the clots. In glaucomatous conditions eserin is advisable, as operation usually spells loss of the eye from further extensive hemorrhage. In recurrent hemorrhages, chlorid of calcium should be given for a prolonged period, as lime is absolutely essential to bring about coagulation of the blood. In robust subjects, the application of leeches to the temple, or to the emissary veins of Santorini over the mastoid, to drain the ophthalmic veins through the lateral, petrosal and cavernous sinuses, is sometimes invaluable.

Three forms of animal parasites have been found in the vitreous: the cysticercus cellulosa, filaria sanguinis hominis, and hydatid cyst. It is important to differentiate them from persistent hyaloid artery, hyaloid canal, and detachment of the retina. Having arrived at a diagnosis, there is but one thing to do, and that is to remove them, first having obtained the consent of the patient to removal of the eye if the effort fails. The best prophylactic measure is to avoid eating raw meat or permitting dogs to lick the hands or face.

Crystals of cholesterin, tyrosin and phosphates occur in the vitreous humor, and are known as synchysis scintillans, and appear as innumerable bright specks upon ophthalmoscopic examination. They no doubt are the products of faulty pancreatic and hepatic metabolism. I have not observed that they interfere with vision, and there is no known remedy for them.

Perforating injuries of the vitreous with the introduction of infection, resulting in suppuration, usually call for enucleation to forestall sympathetic ophthalmitis. Retained foreign bodies almost invariably result in atrophy of the globe or suppuration, hence should be subjected to attempted removal at least, as a precautionary measure.

Nasal accessory sinus disease, infections of the tonsils and adenoids, and pyorrhea and abscessed roots of teeth, and, in fact, any focal infection, may secondarily cause disease of the nerves, lymphatics and blood vessels of the eyes, and result in vitreous opacities. Accordingly, they should all be subjected to a thorough examination and proper surgical measures resorted to in order to relieve the condition.

The inflammations of the ciliary body, retina and choroid, accompanied by exudates and vitreous opacities, should be treated by the instillation of atropin, dionin, iodid of potassium, laxatives, sweats with pilocarpin, and Turkish baths, protection from too bright illumination from the sun or artificial lights, subconjunctival injections of cyanid of mercury or normal salt solution, diuretics (of which acetate of potash is one of the best), iron, quinin and strychnin, to improve the blood and general nutrition. Many patients will require a prolonged course of treatment, extending over several months or years, before the opacities in the vitreous are entirely removed, as I have demonstrated in some very grateful cases in whose eyes there were many floating and fixed bodies, and that are now perfectly transparent and free from them.

XL.

THE HISTORY OF THE OPERATION FOR CATARACT.*

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As with many other surgical operations, some vague records of surgical procedures for relief from the blindness due to cataract have been handed down to us from the misty horizon of the earliest written accounts of civilization. We of European descent are generally disposed to date everything in medical science and art from origins in Greek civilization. This is due to the fact that most of what was known and done in medicine before Greek times has been handed down to us in Greek dress. In reality the records of civilization, and therefore of medicine and surgery, date back thirty generations before the days of Herodotus. The science of the Greek was not essentially of native growth, but largely derived from and influenced by that of Africa and Asia, and more particularly of Egypt and Babylon.

The primary civilizations of the world, so far as our knowledge goes, were developed in the valley of the Nile, in the valleys of the Euphrates and Tigris, in the valley of the Ganges, and in the valley of the Yang-tse-kiang. Plato makes his Egyptian say to the Greeks that they have no science gray with age; but on the other hand Plato himself declares: "That which we Greeks received from the barbarians, we love to improve and to perfect."

The word cataract was used as loosely among the ancients as among the laity of the twentieth century. It implied then, as it does very widely in the present day, some condition of the eye which changed the appearance of the pupil and was accompanied by blindness. It is not yet much more than a half century since the discovery of the principle of the ophthalmoscope. It is hardly strange that before that event the appearance of the pupil was the most important detail relating to vision. The Greek name for cataract, glaucosis, was merely derived from the change in color of the pupil, being related to the word glaucoma, with which condition cataract seems to have been very generally confused.

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*Read before the Denver Medical Historical Club, February 7, 1916.

The Hippocratic writings with regard to the eye have very little to say concerning its anatomy. We are told that the eye has three coats—the outer thickest, the middle thinner, and the third quite thin. The optic nerve is vaguely suggested in the statement that fine arteries go from the brain to the eye and nourish the eye through its fluid contents. When these arteries dry up the vision is extinguished. Concerning the formation of cataract, the Hippocratic writings tell us that when the pupils lose their normal appearance and become spontaneously blue in color, this change occurs suddenly, and once it has occurred there is no cure. But those pupils which become "sea-colored" only lose their vision gradually in the course of a length of time, and often the second eye only becomes blind a long time after the first. The former description has been thought to relate to acute glaucoma, but might equally well apply to a retinal detachment.

Galen writes of the internal structure of the eye as follows: "If the eye is carefully dissected, one finds within the coats two spherical fluid tissues: one is as soft as partially melted glass; the other hard as partly frozen ice. The one is called by physicians the vitreous (glassy) fluid, and the harder is called the crystalline fluid, from its resemblance to glass or crystal." The modern anatomic names of the parts of the eye are those which were used by Galen. Even Vesalius, the founder of modern anatomy, made but little advance beyond what Galen had done in the region of the eye.

COUCHING FOR CATARACT.

For many centuries, probably for several thousand years, the only operation performed for the cure of cataract was that of couching. This operation was unknown to the ancient Greeks during the period of their highest culture. Celsus, writing at the time of the Emperor Nero, gives us the first description of this operation from a Greek source. The Arabs of the middle ages described two methods of couching, one that of the Greeks, in which the lens was depressed by means of a sharp needle thrust into the eye; and a second in which the cataract was depressed with a blunt needle after making a small opening through the sclera of the eye with a knife.

But while it is impossible to determine with certainty in what family of mankind or at what stage in civilization this important operation was first performed, the evidence points with a great deal of probability to the inhabitants of ancient India. It was not until the nineteenth century that it was pointed out that the second procedure referred to above as having been mentioned by the Arabs of the middle ages was apparently described by Susruta in Sanskrit, probably about the beginning of the Christian era.

The following translation of Susruta's description of the couching operation is taken from a German translation by Prof. Gustav Oppert of Berlin: "When the expert, in neither too hot nor too cold weather, working from the outer angle of the eye, has separated both white parts from the black of the eye of the patient, who is anointed and sweating, fastened, sitting, and looking straight at his own nose, and (the physician) has well opened both eyes, where they are free from the vascular plexus, the doctor should then carefully but resolutely, neither above nor below both sides from the opening made by nature (pupil), with a lancet which has a point similar to a barley grain, and which he holds firmly in his hand with the middle finger, index finger and thumb, pierce the left eye with the right hand and the right eye with the left hand. Immediately thereupon a drop of water appears and at the same time a noise with the puncture."

"The expert will then, after moistening the punctured spot with mother's milk, and whether the morbid material is firm or movable, let the eye sweat from outside. Then after he has properly fastened a lancet with (windzerstörenden) hemp, cleave the eyeball with the point of the lancet. Then holding the nostril which is on the other side of the eye from the knife, the phlegm which has formed in the eyeball must be removed by snuffing up through the nose. If the eye now lights up like a cloudless sun, or if it is free from pain, it may be regarded as having been well cut. If then forms are recognized, he should take the lancet slowly away, and after he has smeared the eye with melted butter, cover it with a bandage of cloth."

Hirschberg remarks that while this description cannot be certainly regarded as describing the cataract operation still done in India, yet it probably does so. The drawing up of the mucus through the nose may have some connection with the humoral views of pathology. Breton, who in the nineteenth century often saw the operation performed in the East Indies by native couchers, expressly mentions that after the end of the operation the patient was made to blow out strongly through his nose.

Probably as the result, at least in part, of some uncertainty as to the exact meaning of words and phrases in the original Sanskrit, the description of the couching operation just quoted from Susruta is by no means entirely clear. So far as it is comprehensible, however, we may compare it with the following description by Shah of the couching operation as done today in India (retranslated from Hirschberg's German, the original (*Medical Reporter*, Calcutta, June 1, 1894) not being accessible):

"I lately had occasion to observe two native doctors who carried out various eye operations. Their usual and most interesting operation is that for cataract. They put the patient on the ground. The surgeon raises the patient's upper lid with his left thumb, and commands him to look upward. A small incision is made with an ordinary blood lancet. The blade of the latter is wrapped around with a thread, and only the point left exposed. With this point the section is made, about two lines from the corneal margin, downward below and outward, in the sclera. Then the eye is left shut for a while. A copper probe, four inches long, but exposed and triangular for about a half inch at the end, the remainder being wrapped with thread, is used to depress the lens. The triangular end of the probe is introduced into the wound in the direction of the vitreous; the sound is left suspended for a moment, and the patient is told to breathe deeply. Then the eye is opened, and the probe is held between the index finger and the thumb, and gradually raised as far as the outer canthus. While being raised it is simultaneously turned between the fingers. By this manipulation the lens is separated from its upper and outer attachment and pushed downward, and the pupil appears clear. Then the probe (that is, its handle) is raised higher, almost vertically, then it is brought forward and gradually lowered till it touches the cheek. During this movement of the probe the lens is at first depressed, and then forced backward into the vitreous. As the probe is lowered the lens may remain depressed, if it was well separated from its attachments. Or it may return to its original position if it was incompletely separated. If it does so, the same manipulation of the probe must be repeated. And so three times or oftener, until the lens stays down.

After this the patient must close and open the eye a number of times, then he is allowed to see his finger and other objects. A blind man to whom vision is thus suddenly restored is enraptured, and the people roundabout are full of joy and amazement.

The eye is next smoked, from some distance, bandaged, and the patient put to bed."

One of the best recent accounts of couchers and their methods is given by Ekamabram in the *Indian Medical Gazette* for 1910. Ekamabram is himself an experienced native Indian surgeon educated along modern lines, and describes the Indian coucher's operation from the point of view of an eye witness trained in modern cataract extraction. Two instruments were used—one a sort of steel vaccinating lancet without a handle, round which was wrapped dirty cotton to within two millimeters of the point; the other a copper probe which was three-sided for a distance of twelve millimeters from one end, and which was wound with dirty cotton at the place where it became three-sided. This cotton served the purpose of a stop, as in a Bowman's needle. The operator, who had refused to sterilize his hands and instruments, faced the patient and told her to look toward the side away from the cataract. With his thumb nail he marked out over the sclerotic, at a distance of about twelve millimeters from the cornea and two millimeters below the horizontal meridian of the globe, the point at which his instruments were to enter. It will be seen that the danger zone of the ciliary body was avoided. Telling the patient that he was going to apply some medicine, a portion of a paste which he had prepared was taken up on the tip of the cotton-wound lancet and the lancet plunged into the eye. Having stated that the medicine application was over, he next inserted the copper probe into the puncture about as far as the stop, and, with a circular motion of the tip on the puncture as a fulcrum, tore the suspensory ligament, after which with a gentle downward stroke the lens was depressed. The operator removed the probe, covered the patient's sound eye, and demonstrated to the onlookers her ability to recognize various surrounding objects. The eye was then dressed with an irritant paste, and with a dirty wet cloth. The group of itinerant operators left the village on the evening of the day following the operation. By the next morning the eye had developed a severe septic iridocyclitis. The operators, who are known as Vydians, come from a village of about thirty families, who are also agriculturists, and couching of the lens has been practiced by them and their forefathers from time immemorial. They also practice general surgery. Generally they touch only mature cataracts, and avoid cases in which the pupils do not react well to light. The surgical character of the interference is carefully concealed from the patients. Major Elliot, the author of the trephine operation for glaucoma, who comments on Ekamabram's paper, considers that probably over forty per cent of the eyes operated on by the Vydians are lost by sepsis. He is disposed to think that some of the couchers attack the cataract from in front instead of behind.

Hirschberg, commenting on the operation as thus performed, remarks that the educated reader would be surprised that a single eye escapes. He himself paid a visit to Calcutta in 1892, and heard there from the English physicians what he had already read elsewhere, that the ignorant and dirty native quacks destroyed eyes with their cataract operation, and that lasting success was extremely rare. But he confesses that he was unable to obtain personal experience of these extensive bad results, although only those who are dissatisfied with the result of the old operation subsequently visit the English hospitals. In a woman of fifty years who had been operated upon by couching years before, he found good visual acuity in both eyes, although the depressed cataracts had not been detached, but were still to be seen with the ophthalmoscope. He later visited the Mayo Hospital in Jaipur, which was under the control of a skillful British surgeon. In this hospital were a number of cases of cataracts which had been operated upon by the modern method by a native surgeon of modern training; but in only one of these cases had the operation been fairly successful, four were but slightly successful, and one had suppurated. This native surgeon declared that the "natives had only one per cent of successes." But as Hirschberg passed a half hour later through the crowded main street, he saw one after the other three persons with the familiar thick cataract spectacles.

"I called them to my carriage," he writes, "and began to question them, with the aid of my driver. They were between fifty and sixty years old. One had been relieved of his cataract sixteen years earlier after two years of blindness, by an "empiric" in Lucknow. (They called it water, like the Arabs in the middle ages, and after them the Salernites.) Both eyes saw well and looked excellently. The second individual had had one eye operated upon a number of years earlier; one eye looked well, the other was still blind with cataract. The third person had been operated upon by a native quack in the left eye with excellent results; in the right eye by extraction in the English Hospital, with moderate results.

"My conversation had brought together a large crowd. The street was almost blocked. One man stepped forward, showed me the cataract in his right eye, and asked what he should do. I answered that he should go to the English Hospital. What the people thought of this counsel I don't know, but I could give no other.

"My curiosity was now aroused to the utmost degree, and I wished to become acquainted with one of the expert couchers. From the first barber of the city I finally obtained the address of one of these. In a neighboring street I found the small shop and a well built, fairly well dressed, intelligent looking man of scarcely thirty years. But he failed to show me his instruments, remarking that he had broken them and had given up the practice. . . ."

As a matter of fact, Hirschberg reminds us, the work of the native unlicensed cataract couchers is forbidden by the British Government, under a penalty of two thousand rupees (about $600).

Hirschberg was able to discover several other persons whose cataracts had been couched with good results; but although he bribed all the blind beggars on the streets to let him examine their eyes, in none of them was he able to discover eyes which had shrunken as the result of couching for cataract. He considers that the secret of these apparently good results obtained by the native couchers is to be found in the fact that in India senile cataracts become mature twenty years earlier than in Europe; the danger of depression being less in middle life than in later years. He suggests that while in Europe there can be no question of reintroduction of couching for senile cataract in the place of extraction, yet justice demands that we should recognize that in India, for centuries and possibly thousands of years, countless numbers of the population have owed their vision to the operations of native workers.

When we consider the unquestionably great antiquity of the couching operation, and the enormous numbers of people whom it relieved from that darkness which to most is almost worse than death itself, we must respect this operation as one of the greatest achievements of ancient surgery. Like many other works of ancient civilizations of two thousand or more years ago, it endured with but little change until relatively modern times. It was not until about the middle of the eighteenth century that the couching operation gave place to cataract extraction somewhat as we know it today.

The operation of couching is referred to by a number of medical writers during the Christian era. Without reviewing all of these references, it will be interesting to make some comment upon the treatment of the subject by Celsus. Cataract is discussed in his sixth book under the title of "Suffusio." This Latin term corresponds to the Greek one of "hypochyma," and expresses the belief of the ancients that cataract consisted of a fluid which came across the sight. Celsus remarks that cataract can often be dispersed by therapeutic measures in its early stages. But when it is firmly rooted, it demands an operation, which he remarks is one of the most delicate.

After describing the structure of the eye, he continues with an account of the development of cataract, as follows: "Either as the result of an internal disease or of an external injury, a humor grows beneath the two external coats of the eyeball, where I have already shown an empty space exists (that is, in the pupil). This humor gradually hardens and offers an impediment to the internal function.

"The malady is of various kinds. Some are curable, others not. For when the cataract is small, immovable, of the color of sea water, or of steel, and allows of light sensation from the side, there is hope.

"But if the cataract is large, if the black of the eye (the iris) has lost its natural formation, if the color of the cataract is sky blue or golden, if it sways and trembles, then there is almost always no help for it. The cataract is even worse when it is the result of a severe general disease or has followed violent pains in the head or a severe injury."

Celsus regards the old man and the child as alike unsuited for a cataract operation, but he thinks it more likely to be successful in middle life. He speaks of the maturing of cataract and advises waiting until it has become hard. The operation is thus described:

"The eye is to be immobilized by carefully bandaging the other eye with cotton. The left eye is to be operated upon with the right hand, the right eye with the left hand. The needle, which is sharp enough to enter the eye easily, but should not be too thin, is applied and carried at right angles through the two enveloping coats of the eyeball, exactly midway between the black of the eye (the corneal margin) and the temporal angle, straight toward the center of the cataract, but so that not a single blood vessel is injured. . . . As soon as the needle has entered the eyeball, it must be directed toward the cataract, and on reaching this it should turn a little and quite gradually draw the cataract below the pupillary region; but as soon as it has passed the latter, press more forcibly, so that it stays below."

The reference by Celsus to ripening of the cataract depends upon the old conception of cataract as an exudate in the pupil, which coagulates and only in this hardened condition is capable of being depressed by the needle.

The works of Celsus are the oldest writings of a Greco-

Roman physician in which ophthalmology is systematically dealt with. Celsus lived from 25 B. C. to about 50 A. D. The immortal Galen died in Rome in 201 A. D. The great writers after Galen, from Oribasius in the fourth century to Aëtius and Alexander in the sixth century, Paullus in the seventh, Leo in the ninth, Theophanes in the tenth, and Actuarius in the fourteenth century, deal with diseases of the eye under the same names and with practically the same descriptions; so that the statements concerning ophthalmology extending over a whole millennium vary rather in prolixity than in the actual contents of their text.

According to Hirschberg, the most complete and at the same time the most compact account of what the Greeks and their followers knew or believed concerning ophthalmology is contained in the writings of Paullus of Aegina, who lived in the seventh century of our era at Alexandria, the metropolis of the scientific world of that time.

In Paullus' description of cataract we find repeated the old conception of cataract as a humor which came across the pupil. He states that cataract arises principally from chilling and from weakness of the optic innervation; further through severe vomiting, injury, and many other causes. He clearly states that all cataract patients have light perception, more or less; by which they are distinguished from patients with amaurosis and glaucoma.

For century after century, probably for a total period of at least two thousand years, physicians and surgeons believed that cataract consisted of something placed before the lens of the eye, and the truth that the obstruction to vision consisted of an opacity in the lens itself failed to penetrate their understanding. Gentile da Foligno, a professor in Bologna, Padua, and Perugia, in which last-named town he died of the plague in 1348, sagely remarked: "Concerning this question (as to the situation of cataract) there was always dispute among the ancients. It is strange that so far no one has reached a decision in the matter by dissection of an eye affected with cataract." But it was not until three hundred years later that this advice was followed.

The honor of demonstrating the truth is divided among Rolfinck, Quarré, Lasnier, and Palfyn. Finally, in 1682, after dissection of an eye which had p upon by couching, Blegny declared t was lacking in this eye, and he adds: " from an opacity of the crystalline lens

But the great credit of at length c so long before erected by Galen belon seau. In his "Treatise Concerning C he tells us that in a number of exper he found that after passing the needl iva, he could not carry it into the going through the lens; which, accordi that the crystalline lens was essential t the sight instead of restoring it. H upon the eye of a soldier who had h found the opaque lens at the bottom it had been pushed by his operation. the conclusion that cataract was a har the lens. In announcing his discovery the printing press, he shows a delightf ness by pointing out that a number of o this discovery, and especially in ackn temporary Antoine had at about the sa ently arrived at the same result.

CATARACT EXTRACTI

We now come to consider the circum directly to the discovery of the mod In 1709 the surgeon Petit wrote to Bris the following statements: "Eighteen n couched a cataract in the right eye of years, and when the cataract had rise days, repeated the operation. A spot n in this eye. One saw (January, 1708) part of the cornea a rounded yellow a part of the pupil. In the presence of Remy I incised the lower part of the co angle with a needle, entered the anteri the counterpuncture at the nasal angl cornea with a lancet, using the groov duced a small spoon and brought the b need to take a vote on the matter. Everybody, including those who believed in a membranous cataract, declared openly it was the lens. The eye healed, and recognizes large objects; but reads fine print with a strong convex glass which takes the place of the crystalline lens."

The new doctrine that cataract was an opacity of the lens itself, and that the lens was actually depressed in the cataract operation without loss of the function of vision. met with many opponents. One of the most prominent of these was the Englishman Thomas Woolhouse, who represented the fifth generation of a line of ophthalmologists, and was himself ophthalmologist to James II and William III. The controversy between him on the one hand and Brisseau, Antoine, and Heister on the other lasted into the first third of the eighteenth century. In the second third of the century the fight had lost its interest, because the victory had been won. Other defenders of the old doctrine were Hovius of Utrecht, Freytag of Zurich, and Hecquet, formerly a physician in Paris, later inmate of a Carmelite cloister. The leading partisans of the new faith were Heister in Germany, Boerhaave in Holland, Valsalva and Morgagni in Italy, John Taylor and Cheselden in England, and Morand, Saint-Yves, and Petit in France.

Out of the knowledge that the crystalline lens itself was the seat of cataract grew the radical and highly important transition from couching to extraction. The honor of proclaiming and establishing the latter operation as the proper method for the cure of senile cataract belongs to a Frenchman. Hirschberg, the famous ophthalmologist of Berlin, Germany, speaks of this epoch-making event in the history of medicine as follows: "The same interest which the Goethe investigator and amateur manifests towards the original Faust (Ur-Faust) should be shown by the scientific ophthalmologist for the first publication of Daviel as to his new cataract extraction."

Jacques Daviel was born in Normandy in 1696. He was among the most active physicians during the terrible plague which afflicted Marseilles in 1720 and 1721. His enthusiasm for anatomy is evidenced by a statement of his friend, Dr. de Joyeuse, that "Daviel cannot get corpses enough."

In April, 1745, he attempted to perform a cataract operation in the old style on a hermit of Aiguille in Provence. He

says: "For a half hour did I work i
operation on the same eye I made use (
I have designed, without point and wit
patient was able to distinguish all obje
weakened by the first operation, the se
lowed by suppuration, which I ascrib
of time between the two operations."

The communication by Daviel from
tation is taken contains the further s
time after this failure he continued to
ion. Possibly from some lapse of m
quite different account of the second
According to this, he attempted an o
eye, the first eye having been lost by a
attempt to depress the cataract not or
but caused parts of the broken cataract
chamber. "This accident," he says, "
ing to the procedure of Petit, to open
in order to empty the blood and the
of the anterior chamber."

This case, says Daviel, brought him
would in future only operate by the
adopted with the hermit. He did th
previous couching) for the first time i
this case he opened the cornea, freed
cataract with the small spatula, and re
fragments out of the eye with the aid o
The pupil appeared clear, the patient
disturbance, and two weeks later th
healed.

In enumerating the advantages of
procedure, Daviel lays stress upon the
depress a cataract one must wait until i
times it does not become altogether fi
new operation the cataract can be extra
and without waiting for maturity. In a
yet it is common knowledge that the eye
not care to attempt cataract extractio
incision until "ripening" has taken plac

An interesting account of the perfo

operation according to the method of Daviel is contained in a small work entitled "Geschichte des grauen Staares, und der neuen Operation Solchen durch Herausnehmung der Crystallinse zu heylen" (History of gray cataract and of the new operation to cure the same by extraction of the crystalline lens), written by Johann Gottlieb Schäffer, and published at Regensburg in 1765.

It had evidently not been long before the new operation was seized upon by a number of enterprising surgeons. One of these, "the famous and very skillful ophthalmologist, Herr Michael Johann Baptist von Wenzel," came to Regensburg in 1761 and performed the operation which was witnessed by Schäffer.

This author proceeds to discuss the opposing theories as to the nature of cataract, and sensibly remarks that if the blindness of cataract were merely due to a membrane in front of the lens, those operated upon by couching would not require strong convex lenses before their eyes in order to be able to see clearly after operation. He himself has entirely adopted the belief that the gray cataract consists of nothing else but an opacity of the lens of the eye.

The patient who was brought to Wenzel by Schäffer for operation was a married woman of sixty-seven years, who had been blind for five years from cataract in both eyes. The description of the operation is as follows:

"After I had spoken with him of the most essential matter, also had negotiated down the one hundred Louis d'or which he at first demanded to fifty ducats, and had prepared the patient the day before the operation with a softening clyster, the same was operated upon by him on the 23rd of May in the following manner:

"Madam the patient was seated upon a rather low chair opposite the light, and her right eye was held closed, and her head in a fixed position, by an assistant who stood behind her. He, the operator, had arranged on a table a ("Diapalmenpflaster") spread upon linen, a glass with half water and brandy, some compresses, and his instruments. The latter were:

(1) A straight bistoury or incision knife.

(2) A concealed lance-shaped cataract needle, which Prof.

la Saye calls a cystitome, and which is not unlike a pharyngotome.

(3) A slender longish spoon or curette, the handle of which forms a small spatula.

"Hereupon the operator seated himself on a somewhat higher chair facing the patient; and laid his right foot on the patient's seat, in such manner that he could support his right elbow on his right knee. Then with the thumb and index finger of his left hand he sought to keep the upper and lower eyelids of the left eye apart and to hold the eye fairly firmly; told the patient to keep her eyes as still as possible, and thrust the small knife, which he held like a writing pen, with his very steady right hand quickly into the left outer angle of the eye, near the limbus of the cornea, about half a line from the sclera and in the direction of the center of the pupil; turned the knife forward between the iris and the cornea, until its point came out on the other side, and lastly cut through the cornea downward, so that in this manner the cornea was divided for a half of its circumference. As now through this semilunar wound the aqueous humor escaped, and therefore the convex cornea became relaxed, the operator first demonstrated (zeigte) the delicately made wound with the spatula, and then carried the hidden cataract needle into the open anterior chamber through the pupil to the cloudy crystalline lens, pushed the concealed lance-shaped cataract needle out. and with it separated the lens from its attachments, brought this instrument out, after the needle had again been concealed, and after gentle pressure of the eye with the fingers, one saw the cloudy crystalline body escape from the ocular wound, which the oculist received with his little spoon, and showed to the spectators."

Schäffer gives a few further details as to the removal of fragments of the lens cortex, and tells how the operator covered the eye first operated with a cloth until "with equal adeptness and caution he had operated upon the right eye with his left hand in the same fashion; whereupon the cloth was removed from the left eye and the patient asked whether she could now see." Finally the oculist covered both operated eyes with the "Diapalmenpflaster," over which he laid some compresses moistened with the mixture of brandy and water; the whole being covered with a bandage four fingers wide so arranged that every three hours it could be moistened afresh.

Schäffer intimates that von Wenzel was in a hurry to leave for other cities on the first of June—that is, nine days after the operation on this first patient, although in the meantime he had done two further operations.

It is well to recall that these operations were done without an anesthetic of any kind, and also without antiseptic precautions. It will be noticed that Daviel and his followers opened the cornea from below instead of above, as is done in the present day.

An interesting illustration of the fact that medical human nature of the eighteenth century did not widely differ from that of the twentieth century is contained in the following quotation from one of the concluding paragraphs of Schäffer's treatise: "It might serve for improvement and still greater perfection of this new cataract operation, and be of great utility to blind persons, if in our Germany the true and genuine surgeons themselves industriously practiced this eye operation and showed more love of humanity than is commonly done by the foreign wandering and often quite spurious surgeons, whose only object is the patient's money, whether they can give many hundred or fifty Louis d'or or ducats; and who when they have received these sums journey away, leave the patient, and busy themselves with finding new ones in other places. Hos enim non urget amor proximi, sed auri!" ("For these are not inspired by love of their neighbor but of gold.")

The operation of cataract extraction as done today is essentially that devised by Daviel one hundred and seventy years ago. Fortunately, detailed modifications in technic, more accurate information as to the proper time for operation, and to some extent our modern knowledge of the principles of asepsis have reduced the 11.7 per cent of eyes lost by Daviel to the four or five per cent prevailing in the present day. Probably the greatest name since Daviel in cataract surgery is that of von Graefe, who about fifty years ago not only introduced important reforms as regards the knife used and the character of the incision, but also demonstrated the advantages to be derived in many cases from excision of a portion of the iris.

XLI.

A COMPARISON OF RESULT
TREPHINE OPERATION A
ON THE SAME PATIENT
OF GLAUCOM

T. H. ODENEAL, M

OPHTHALMOLOGIST AND OTOLOGIST T
STATE INFIRMA

BEVERLY, MASSACH

John ——, colored, aged seventy ye
time of very severe headaches, for
absolute blindness in both eyes of sev
to cataracts primarily, glaucoma follo
me light perception was nil. Tension
hundred and twenty millimeters Hg
and an accurate measurement was im

An Elliot trephine operation of the
was decided on, to relieve the headac
of restoring the sight. The operatio
the Fox flap, the pressure falling to
Hg., and remaining there.

One month later an iridotasis of the
and not a trephine, in order to contras
the pressure of the two eyes being a
operation there was some difficulty in
wound after it had been drawn up int
from senile changes, but a successful te
and the pressure fell to about forty, a
mine.

After the patient was discharged f
tion I did not see him for four or fi
called to treat a severe conjunctivitis c
taking the tension of the eyes I disco

crease in tension of the right eye, whereas the left was practically the same as after operation.

The conjunctivitis (which was of a serous type) subsided without purulent infiltration of the flap of either eye. This conjunctivitis, I discovered, had been going on for some time, the patient having had boric acid irrigations. Since this attack the tension of the right eye has steadily mounted until now, one and a half years after operation, it is about eighty to ninety millimeetrs Hg., the left eye in the meantime remaining the same.

Here we have two eyes of exactly similar characteristics, the same degrees of pressure, same amount of resistive power, and affected with a conjunctivitis of same intensity and like infective agent, the one eye maintaining filtration after operation, the other blocking up. As the largest trephine was used and a perfect iridectomy and flap obtained, the operative technic could not have been at fault.

Of the two operations the trephine offered the better chance of giving a permanent good result, as this was a difficult case on which to perform the iridotasis, due to the rigidity of the iris. In this particular case no doubt the failure of the trephine operation was due to the conjunctivitis which intervened, causing a thickening of the flap with exudation of serum and corpuscles forming an inflammatory infiltrate about the filtration opening. On account of the simplicity of performing the iridotasis and the less liability of infection and closure of the drainage opening, it is my opinion that this operative procedure will in time displace to a large extent the Elliot trepaning, when it becomes more generally tried by the ophthalmologic profession.

As the same process (conjunctivitis) took place in the left eye, without closure of the filtration opening, it is readily seen which of the two operations is more liable to failure from postoperative inflammatory conditions; and as the factor is a very important one, we should consider it carefully before deciding on our modus operandi.

ABSTRACTS FROM ENGLIS
LITERATURI

BY

WALTER R. PARKER,

DETROIT.

WM. EVANS BRUNE

CLEVELAND.

EDGAR S. THOMSON,

NEW YORK.

NELSON M. BLACK,

MILWAUKEE.

EDWARD C. ELLETT,

MEMPHIS.

GEORGE S. DERBY, M

BOSTON.

The Apocritic Principle and the Evolutio

PARSONS, J. HERBERT (*British Jour* July, 1917), writes a very interesting of visual perceptions. It does not lenc should be read in the original.

Some Remarks Upon Spring Catarrh—Wi
Its Diagnosis and Its Treatment

BUTLER, T. HARRISON (*British Jour* July, 1917), reports two cases of sprir treated by radium. Attention is called catarrh appears in three forms: the corneal, and the mixed.

Where there is a question as to diagnosis, microscopic examination of the secretion will invariably show eosinophile cells in spring catarrh. Another useful sign is the peculiar milky appearance of the conjunctiva, both palpebral and limbal.

Case 1.—Male, aged thirty-one years, in whom the upper lids exhibited the typical tessellation of spring catarrh. The conjunctiva was milky, and eosinophiles were found in smears from the conjunctival secretion. There was great lacrimation, itching and photophobia.

A tube containing forty-five milligrams of radium bromid was applied to the everted upper lids for five minutes, and repeated after intervals of three weeks. A cure was obtained in this case, which had resisted all kinds of treatment for a long time.

Case 2.—A girl, aged fourteen years, had had several attacks of spring catarrh which appeared in May, lasted all summer and improved with cold weather. The lids were rough, but did not show the typical tessellation of spring catarrh. Each cornea was surrounded by a gelatinous. nodular rind of raised tissue of the kind which is characteristic of spring catarrh. The conjunctiva had a milky appearance, and the secretion contained a large number of eosinophile cells.

The effect of the treatment was not so immediate as in the first case, but when the reaction passed off the patient had lost all subjective symptoms, the circumcorneal elevations were much smaller, and all injection had disappeared. The writer looks upon radium as a specific for spring catarrh. W. R. P.

Anophthalmia and Microphthalmia.

DAVIES, D. LEIGHTON (*British Journal of Ophthalmology*, July, 1917), reports one case of anophthalmia and four cases of microphthalmia of varying degrees of deformity.

Case 1.—This case showed marked facial asymmetry, the right side much smaller than the left. The eyelids on the right side are small, and the palpebral fissure is also very small, being only seven to eight millimeters wide, and occupying the inner half of the lids. The puncta lacrimalia are both present. A few cilia are present on the upper lid only. There is no eyeball in the orbit, which is, however, lined with conjunctiva. This is puckered up a little at the posterior extremity, where there is a tiny nodule, scarcely the siz conjunctiva moves when the left eye r as the socket of an eye from which t cleated. In addition, there is marked external auditory apparatus.

Case 2.—Bilateral microphthalmia in who also exhibited a markedly oblique p fissures. The right eye is extremely coloboma of the iris, downwards, and choroid. The right eye is larger than t sized. Coloboma of iris and choroid has an internal nonparalytic squint an

The other three are similar less ma thalmia.

The writer believes that it is possible t mia as being of the same type as micropl degree, because in the great majority o is associated with definite structural d fects which may be regarded as being ment or actual failure of development. able that they are both dependent on a are more or less similar in each type of

The possible causes of congenital grounds are then discussed but no defi

The Relation of Ophthalmology to th

Edridge-Green, F. W. (*British Jour* July, 1917). The purpose of this paper possible aberration of function in accor of vision is represented by a disease of t have hitherto had a satisfactory and ac

The theory of vision is given as foll impinging on the retina liberates the v rods and a photograph is formed. Th only with the formation and distributior not with the conveyance of light impuls ends of the cones are stimulated throug composition of the visual purple by light is set up which is conveyed through t to the brain. The character of the stimulus differs according to the wave length of the light causing it. In the impulse itself we have the physiologic basis of the sensation of light, and in the quality of the impulse the physiologic basis of the sensation of color. But though the impulses may vary in character, according to the wave length of the light causing them, the retinocerebral apparatus is not able to discriminate between the character of adjacent stimuli, not being sufficiently developed for the purpose. This power of discrimination varies with individuals, and hence the different varieties of color perception which are found.

When the sclerotic, choroid and pigment cells of the retina are removed, the external fovea is seen as a small basin, with four canals leading into it, the whole forming an appearance like a star fish with curved rays. In normal conditions there is a circulation of lymphatic fluid, sensitized by the visual purple from the surrounding parts of the retina, into the external fovea and then out through the choroid into the lymphatic spaces of the optic nerve. This retinal circulation is greatly aided by the four canals.

Obstruction to this retinal lymphatic circulation would tend to dilate these canals and cause the star fish figure to be visible with the ophthalmoscope. This has been found by Horsley in tumors of the frontal lobe, and by the writer in posterior staphyloma. Sudden obstruction might cause retinal detachment, and may be responsible for many cases, especially of the macular region.

Miners' nystagmus is explained by the tendency of the eye to oscillate when light falls upon the fovea and not upon the surrounding portions of the retina, the oscillation ceasing when the peripheral portions of the retina are stimulated. Searching nystagmus in conditions with obstruction to central vision is set up by the desire to obtain better vision by more efficiently sensitizing the fovea by moving the eye.

Amblyopia may be caused by any reflex inhibition of the distributing function of the rods, no ophthalmoscopic changes being found. Removal of the cause leads to a complete restoration of sight. In the amblyopia of squint the function may remain permanently in abeyance, on account of the early stage of development of the individual.

Erythropsia is explained by the fac
formed under the influence of a very t
sensitive than normal to the red end
photochemic substances, when acted
have a maximum in their luminosity
the red end of the spectrum.

Congenital night blindness would ap
fective power of the rods to respon
feeble light. This same condition wo
long exposure to very bright light. I
the rods by a poison would account fc
without ophthalmoscopic appearances,
turned, left optic atrophy, contracted
ness, as in quinin poisoning.

Peripheral stimulation of the reti
illumination of only the central portio
as by a reading lamp, may lead to hea
tional disturbances, which disappear
corrected.

Reversal of the color fields is expla
there are two definite physiologic proce
corresponding to the photochemic decc
surrounding the cones, which has been
purple, and the other to the stimulati
cones by the decomposition products.
not nearly so active in bleaching the vi
blue, when it does produce an effect at a
In torpor retinæ, then, the action of tl
affected than that of green. In hype
condition would be present and the re
blue, as is found in hysteria.

If the supply of sensitized fluid to th
tral scotoma would occur; while if the
a fluctuating or scintillating scotoma wo

Protection of the Eye in W

Cruise, R. B. (*British Journal of O*
1917), has designed a visor for protecti
fare.

From statistics of two hundred conse

Dunstans, fifty-two per cent were classified as preventable injuries.

The figures from one hundred and twenty eye cases at the Third London General Hospital were still higher. So that the conclusion reached was that at least fifty per cent of all eye injuries are preventable by a proper protecting visor.

The visor is described as a transparent mesh of steel rings, so closely linked together that only the most minute particle could pass through its meshes, and then only if it were struck at right angles to the plane of its surface; a tangential blow would meet with a practically continuous barrier of steel.

The visor is fastened to the helmet. It is, therefore, not a separate piece of equipment to be remembered and attached to an already overloaded body.

When not required the visor can be thrown up onto the brim of the helmet, and lowered again, as occasion requires, by a simple process of unhooking a chain and refastening to another hook.

A chemical process renders the links rustproof. W. R. P.

Papilledema in Relation to Gunshot Fracture of the Mandible.

WALLIS, G. F. C. (*British Journal of Ophthalmology*, August, 1917), reports a case of a badly wounded soldier, who received no less than thirty wounds from the explosion of a trench mortar bomb. The left ramus of the lower jaw was shattered, the lower division of the facial nerve severed, and the left side of the face below the orbit paralyzed. The right eye was lost following severe hypopyon ulcer. The left eye showed powder impregnation of the conjunctiva and a foreign body embedded in the outer cornea, at which point the pupil was drawn to one side. No perforation, vision full, and fundus and media negative. Following the removal of sequestra of bone from the jaw wound he developed a papilledema of S. + 3 D., accompanied by such general symptoms as nausea, headache, and fever. Keeping the wound open and draining freely, without further attempt at removal of bone fragments, was followed by amelioration of the symptoms, with long slow resolving of the papilledema and recovery of normal vision.

The inference is that the explosive force which had com-

minuted his jaw had at the same tim
bone into the glenoid fossa and cause
that the interior of the skull had, at a
from septic matter by a fibrinous de
the parts were disturbed, allowed th
On this hypothesis a local meningitis
in turn gave rise to the classical sig
and papilledema.

Note on Retinochoroidal

Parsons, J. Herbert (*British Jou*
August, 1917), calls attention to the fa
alone is ruptured, a scar composed of
of fibrous tissue is found. When, ho
retina are ruptured, very considerable
are formed, often projecting into the
out processes which resemble those o

The proliferation of fibrous tissue
choroidal ruptures is explained as fo
vitreous hemorrhage, due to rupture
is little mesoblastic tissue in contact wi
providing fibroblasts to bring about o
The vitreous itself is inert, and its
have little organizing capacity. Henc
and only in exceptional cases does so
erans" occur. When both choroid an
the mesoblastic choroid affords an a
fibroblasts, and the clot organizes into
in exactly the same manner as in a hen
connective tissues.

This would be an argument against t
foreign bodies from the vitreous by int
small magnet through an incision whi
choroid and retina. By this method
are enabled to escape into the track of
exuberant fibrous tissue formation.
alternative method of drawing the for
terior chamber with the giant magnet,
moval from the eye.

A Case of Ethmoidal Injury Associated With Papilledema, Abducens Palsy, and Other Ocular Lesions.

WATKYN-THOMAS, F. W., AND SCOTT, R. L. (*British Journal of Ophthalmology*, August, 1917), report a case of ethmoidal suppuration following a wound below the right eye by a fragment of shell. Apparent healing associated with dimness of vision, was followed ten days later by headache and vomiting. The lids became swollen and the conjunctiva edematous. The pain became very severe on movement of the head. There was definite tenderness over the inner canthus. Movements were sluggish in all directions. The pupil reacted to light, but slowly. The intraocular pressure was much raised. A very incomplete examination showed that the field was narrowed all around. Only with difficulty could he count fingers at one meter.

Fundus hazy, vitreous hemorrhages, much exudate, disc red, 3 D. of swelling, no retinal hemorrhages. Vessels, where visible, engorged. Left eye normal.

Skiagrams demonstrated a small fragment of metal well forward, probably in the ethmoid labyrinth. St. Clair Thomson's modification of Moure's operation was performed. A lateral nasal incision was made, the flap turned back and the infraorbital nerve and lacrimal sac retracted. The superointernal angle of the maxilla was removed, but the fragment had dropped into the antrum and was not recovered. The ethmoid gallery was found to be considerably damaged; the bone was splintered as far back as the posterior cells, and the mucosa was engorged and edematous. The orbitonasal wall was shattered. No pus was found. All loose bone and damaged mucosa was removed with Hartmann's forceps and Cordes' punches. The orbit was cautiously explored, but no pus was found there, although the orbital connective tissue was very edematous. For more efficient drainage the upper part of the lateral nasal wall, which was already fractured by the chisel cuts, was sacrificed. This was done with very little hemorrhage. The flap was sutured with fine gut and the cavity packed with gauze ribbon soaked in one-tenth bismuth in paraffin.

The patient steadily improved, paralysis of the abducens, which was present for a long time, also gradually becoming less marked. The vision was 6/24 at the last examination.

The points of interest in this case are:

1. The sudden onset of intense pain, which was probably due to the increase of tension.
2. The association of greatly increased tension with papillitis.
3. The paralysis of the external rectus. W. R. P.

Report on Ophthalmic Cases in Cairo and Alexandria.

Eason, H. L. (*British Journal of Ophthalmology*, August, 1917), submits a statistical report of the ophthalmic cases seen in British Hospital in Cairo and Alexandria during the first six months of 1916.

In all a total of 5,810 cases are charted, of which 2,683 were errors of refraction; 139 injuries of the eye; 2,105 diseases of the eye, and 883 with no appreciable disease. Nearly fifty per cent of the cases are errors of refraction, so that the basis of the work is in the estimation and correction of these errors. The great difficulty among soldiers is that the visual defect from which he is suffering is used by him as a possible means of avoiding active service, or if not actually of avoiding all service, of getting some lighter duty at the base or on the lines of communication. He therefore makes the most of his defect instead of the least, and is not actively concerned with getting it improved with glasses.

An important part of the work, therefore, is the detection of malingering. Some cases of functional loss of vision ascribed to shell shock were seen; in all the recovery was rapid.

Many soldiers in Egypt, both British and Indian, have complained of night blindness. As this condition may be associated with malnutrition, careful examination has always been made, but little actual disease has been found. A few cases of genuine retinitis pigmentosa have been seen, but no cases of conjunctival xerosis; and in the majority no ocular disease has been found, and the men have appeared to be in good condition and well fed.

Conjunctivitis has regularly caused about ten per cent of the ophthalmic cases in the British hospitals. The two main varieties of conjunctivitis were the Weeks' infection, the ordinary acute mucopurulent conjunctivitis, and the Morax type—the angular conjunctivitis.

The routine treatment for cases of conjunctivitis in Egypt, both in military and civil practice, is by silver nitrate, protargol or argyrol in acute cases, where the discharge is profuse, and by zinc sulphate in all chronic cases, or in Morax infections. The zinc sulphate was usually ordered in solutions of a strength of three grains to the ounce.

The cases of trachoma have been rare and only sporadic, and there has been nowhere anything approaching even a local epidemic.

Corneal ulcers have been comparatively frequent, especially among troops camped in the desert. The marginal and dendritic varieties have been the commonest; and the dendritic ulcers especially have proved very intractable.

There have been an unusual number of young men in Egypt with early degeneration of the retina and choroid in the macular region. The condition is entirely different from the single focal patch of acute exudative choroiditis in or near the macular region, commonly met with in patients in early life, and more nearly resembles the ordinary senile change.

Some of the patients have given histories of having been under shell fire, and it has been a question as to whether these changes may not be a later sequel of ocular retinal concussion.

The conclusion is that there is comparatively little serious disease among the troops. W. R. P.

Fundus Lesions in Cases of War Nephritis.

EVANS, J. JAMESON (*British Journal of Ophthalmology*, August, 1917), gives the results of his examination of the fundus in one hundred cases of war nephritis. No attempt was made to differentiate types or degrees of nephritis.

Normal fundus, forty-three per cent.

Changes noted in fundus, fifty-seven per cent.

The fundus changes observed:

1. Involved the optic nerve and retina in thirty-nine cases.
2. Involved the choroid in thirty-four cases.

The fundus changes as a whole are very slight in degree. In twenty-two cases the optic disc was hyperemic and slightly edematous; in thirteen cases there was peripapillary retinal edema, some perivascular lining, and tortuosity and fullness of the veins. In eight cases the disc appeared pale or grayish without definite atrophy of the papilla. In only one case was the classical appearance of the hemorrhagic neuroretinitis of albuminuria observed, and this was in a man who was fifty-six years of age, and who evidently suffered from chronic Bright's disease. In no other case were retinal hemorrhages observed. In no other case was any definite evidence of arteriosclerosis noted, although in two cases there was some suspicion of arterial pressure on the veins. Fine dotted changes in the retina in the macular region were observed in four cases, and one case showed some edema at the macula, with reduction of vision to 6/24.

The choroid showed depigmentary changes in the equatorial region in eighteen cases. These depigmented areas were sometimes arranged diffusely around the periphery and often showed fine pigmentary deposits; or they were continued to a sector of the globe. At other times they appeared as whitish or yellowish streaks with slightly pigmented borders, reaching from the intermediate zone to the periphery. In none of these cases was there any evidence that there had been acute choroiditis. In twelve cases, however, there were discrete orange colored spots with little or no pigmentation, but evidently of the type of the disseminated choroiditis. Two cases showed typical areolar choroiditis with marked pigmentation, such as one might ascribe to syphilis.

Five cases showed guttate changes in the macular region, and these we should at once diagnose in patients of more advanced age as central guttate choroiditis or Tay's choroiditis.

The most peculiar choroidal changes observed were patches of slaty discoloration in the neighborhood of the macula. These spots—only one of which was larger in size than the optic disc—appeared to be slightly raised, and the retina over them gave a sheeny reflex. There were five such cases. In three cases the spots were situated along the inferior temporal vessels, in one along the superior temporal, and in one on the outer edge of the macula.

As to the character of the lesion, it would appear that both in the retina and the choroid the process is of a low inflammatory nature, giving rise, on the one hand, to slight edema of the papilla and neighboring retina, and occasionally a few fine retinal deposits; on the other, setting up depigmentary changes in the hexagonal epithelium and choroid, either with or without slight and fine pigmentary deposits; and occasionally more acute but more localized foci showing as fine areolar spots with very limited pigmentary deposits at their edges.

The changes observed seem to point to a toxic or infective origin, such as is associated with the toxicity of advancing age or senility. W. R. P.

Report on the Ophthalmic Department at Lemnos.

Gibson, F. Lockhart (*British Journal of Ophthalmology*, August, 1917), describes the ophthalmic work on the island of Lemnos. The records of one hundred and twenty-six eye cases are discussed.

These are first separated into two large groups, viz., (1) cases neither directly nor indirectly attributable to explosive weapons, and (2) those attributable either directly or indirectly to explosive weapons. Included in these are shrapnel, bombs and bullets, and in the indirect injuries, excoriations of the conjunctiva and cornea from parapet sand and gravel and the impaction of fragments of sand and gravel in the cornea. In each group rather more than sixty cases will be found, practically dividing them equally.

Classified anatomically there were: (1) Conjunctiva, forty-four; (2) cornea, fifty-one; (3) iris, eleven; (4) lens, thirteen; (5) vitreous and fundus, thirteen; (6) sclerotic, seven; (7) lids, eight; (8) orbit, five; (9) anterior chamber, four; (10) foreign bodies, thirty; (11) enucleation, fourteen.

There were fourteen intraocular foreign bodies. Of which six were removed by the giant magnet—three from the anterior chamber; one through the wound in the sclerotic from the vitreous chamber close to it (in this case the foreign body, a piece of steel, was not from an explosive weapon); two from within the sclerotic, but probably not within the choroid. Six foreign bodies were left in situ.

Several of the most interesting cases are described briefly in an appendix.

Case 1.—Intraocular foreign body. A young officer had suffered from several wounds from a bomb explosion. One piece had entered the sclerotic of the right eye on its inner side, behind the ciliary region, and passed backwards through the vitreous, into the sclerotic coat or just through it. In spite of the blood in the vitreous chamber, it was possible to see the posterior wound in the coats, situated above and to the inner side of the disc, but no foreign body could be detected. The X-rays located the foreign body either in the eye or just outside the coats in the neighborhood of the posterior wound. The giant magnet failed to attract it from the orbit or through the reopened wound, or to cause any sensation of discomfort. The pieces of metal found elsewhere in his body were steel. He regained 6/12 of vision—of course, with a scotoma in the position of the posterior injury.

Case 2.—A bullet wound injury in the right occipital lobe in the angle formed by the longitudinal sinus and the lateral sinus, with indirect involvement of the left occipital lobe in its mesial aspect. A trephine operation was performed, after which he had word blindness for a week or two, but gradually regained the power of reading words. The right field, which was very contracted, gradually improved, but the left hemianopsia persisted.

Case 3.—Three bullet wounds of the orbit. (a) Another case of Sir Alexander McCormack's was subsequently transferred to my care, when the trephine wound was nearly healed. The bullet had entered the frontal bone above the temporal region on the left side, and passed out at the angle of the right lower jaw. The case was trephined, but one or two small fragments of the inner table were not removed at the initial operation. The left eye was proptosed with considerable chemosis and solid edema of the lids, but neither lids nor conjunctiva showed at first or later any signs of blood extravasation. The external ocular muscles were all paralyzed, even the orbicularis; apparently more by the solid edema than by direct interference with nerve supply. There was no optic neuritis nor alteration in the vessels of the fundus until nearly two months afterwards, when optic atrophy began to show at the disc. The external ocular muscles all recovered. Cosmetically the eye will be excellent. It will not worry the other, but it will have no sight. The edema and paralysis did not finally disappear until a fine spicule of the inner table was removed through the trephine wound some six weeks after the injury.

(b) In this case a bullet had passed through the back of the orbit and directly injured the posterior part of the globe. There were chemosis, proptosis, much ecchymosis in lids and conjunctiva, and some intraocular hemorrhage. The proptosis and chemosis subsided. The eye did not inflame. Its tension became minus. It had, of course, no sight, but the man was able to go home with the eye in, although cosmetically not perfect, and somewhat shrunken. He was advised to have it removed later.

(c) Another bullet took an extraordinary course. It pierced the right upper lid in its external third, passed out between the edges of the lids without wounding them, but after destroying the cornea, and indirectly the lens, pierced the skin again where the lower lid joined the cheek, passed through the right nostril and the floor of the left nostril, and out through the upper lip below the left nostril. The right eye was removed on admission.

Case 4.—Traumatic myopia. A soldier on the island injured his right eye while chopping wood. The lens was dislocated forward, making the anterior chamber shallow, and causing five diopters of myopia in a previously emmetropic eye. The lens remained clear, and with —5.00 D. the eye saw 6/12. Complete accommodation was retained, although the ciliary muscle must have been ruptured.

Case 5.—Postdiphtheritic paralysis. Swabs from the nasopharynges of two cases of paralysis of accommodation enabled both to be pronounced by the pathologist to be diphtheria carriers. The previous slight sore throats had not called for treatment in camp. W. R. P.

An Attack of Acute Inflammatory Glaucoma Caused by Holocain.

HUGHES, H. S. (*The American Journal of Ophthalmology*, May, 1917). The patient was a woman, aged thirty-four years, in whom a diagnosis of simple glaucoma was made in 1905. When at all uncomfortable, the symptoms had yielded to a one per cent solution of pilocarpin. In February, 1917, tonometric readings, under one per cent holocain hydrochlorid, showed tension right eye, 45 (McLean); left eye, 36. Two hours later the patient developed double acute glaucoma. Operation was considered necessary in the right eye (only).

The author can attribute the onset of this attack to but one of three things:

First. A profound mental impression may have been made upon the patient by putting her upon a table and working over her with the tonometer, to such an extent as to depress her sympathetic nerve poise, with the above result.

Second. She might have been developing this attack the day she came to the office, and the investigation may have been unfortunately coincidental.

Third. The holocain used anesthetically may have been responsible.

The first seems improbable. The patient did not seem the least bit nervous, or even to require the usual little reassuring explanations we are apt to offer a patient who is undergoing an unusual or disagreeable test. She also says it made no unpleasant impression on her mind at the time. Second, the amount of tension registered and the appearance of the eye at the time of the examination did not suggest an attack in process of development; so we are left to the conclusion that three drops of one per cent holocain solution precipitated an attack of acute inflammatory glaucoma in the patient.

The only case in which the instillation of holocain produced an acute attack of glaucoma which the author can recall is one reported by Gjessing in 1913. In this instance an acute glaucoma occurred fifteen or twenty minutes after using a solution of holocain and zinc. E. C. E.

Intraocular Foreign Bodies.

HIGBEE, E. H. (*The American Journal of Ophthalmology*, May, 1917). The methods of removing a foreign body after it has been localized are different, and have brought forth arguments favoring the scleral incision (counter puncture) and the anterior chamber route, both having their followers.

Personal experience, based on the results of two hundred and seventeen cases, has led the author to believe in the counter puncture. In over ninety per cent of his cases he has found the foreign body lying well back in the vitreous body and close to the eye wall, or embedded in one of the tunics of the eye. One of the contentions of those who advocate the anterior chamber route is that the vitreous body should not be injured any more than it already has been, as the shock of the foreign body entering it interferes very much with the eye's nutrition. Then, why disturb it a second time by trying to draw the foreign body back into the anterior chamber? Its route will no doubt be different from the route of its entrance, and while you no doubt disturb the vitreous body some with a counter puncture, it is not as severe as the passage of the body back into the anterior chamber.

After an accurate X-ray localization of the foreign body the patient is placed upon the operating table and the eye prepared as for any important globe operation. Cocain anesthesia is usually sufficient, though at times general anesthesia may be better, but the author has never found this necessary.

The conjunctiva is incised in the location of the foreign body and the sclera bared, avoiding as much as possible the recti muscles. Then an incision over the foreign body is made directly through the sclera, choroid and retina, as cautiously as possible and in a meridional direction (that is, parallel to the recti muscles), for the reason that these wounds bleed less than those cut across the choroidal vessels, and gape less, on account of the fact that the pull of the recti muscles does not open them. The tip of the magnet (Sweet's or Hirschberg's) is inserted in the wound, and usually the particle can be withdrawn with ease.

The wound is then closed with catgut sutures, if it be a large one; and in many cases such a small wound was made that it was only necessary to close the conjunctiva.

The author's conclusions are that the scleral route is a much simpler method than the anterior chamber route.

The danger of infection is no greater in the scleral route than in the anterior chamber route, providing the proper precautions in regard to sepsis are followed out; and in all his cases the author has not had sepsis following one of these operations. Fewer complications are met with by the scleral route. Detachment of the retina is not to be feared in the scleral route, as his experience leads him to believe that clean wounds in the globe are rarely complicated with detachment, and that in those cases of detachment with a wound, the latter has been caused by some large and blunt instrument that had a great deal of force behind it, the body itself being seldom found within the eye.

The small magnet is easier to handle than the giant magnet. There is just as much destruction in the anterior chamber route as in the scleral route, and just as much danger of the retinal cicatrix causing degeneration of the globe.

The author has been able to follow up all of these cases for a period of at least three months, and in a number ranging up to seven years, the summary is fairly complete.

SUMMARY.

Detachment	8 cases
Enucleations	5 cases
Vision 20/20	42 cases
Vision 20/40	49 cases
Useful vision	76 cases
No vision, but eyeball retained	20 cases
Total	200 cases

The first question is which magnet is preferable, and the second which route is the most desirable?

The results of all these experiments seem to definitely establish the great superiority of the Haab magnet in attracting small foreign bodies at a distance of five millimeters or more from its tip. Where the magnet-tip can be brought within five millimeters of the foreign body, it is only necessary to use a large magnet if the particle is very small—one milligram or less. For larger particles within five millimeters, the advantages of a hand magnet are very great, in that it is more easy to handle, and the foreign body can be more gently detached and drawn through the tissues with less disturbance.

On the second question, no difference of opinion exists, where a scleral wound is still open or where the foreign body is very large or very rough and jagged; for all agree that in such circumstances the scleral route is much the best.

In conclusion it seems best to evade any definite statement, and to say that every such case is one by itself, and the method of extraction should be suited to the individual case. It can hardly be denied by anyone that both the large and small magnets are necessary in an oculist's armamentarium, for whatever method of extraction is favored, each magnet will at times be found of most value. The latter statement both Hirschberg and Haab concede to be true. E. C. E.

On Leukemic New Formation in the Retina.

KOYANAGI, Y. (*The American Journal of Ophthalmology,* July, 1917). The patient, a boatman, aged twenty-four years, developed chronic lymphatic leukemia and died after one and one-half years. Six months after the onset of the disease the eyes were normal, but six months before death several small retinal hemorrhages in the macular region were seen in the right eye. The vision then grew worse, but another examination was not made. Sections of the eyes after death showed the following:

Left eye: The retina shows directly above the papilla a circumscribed tumor-like swelling; an accumulation of medium sized lymphocytes with which not a trace of red blood cells is mixed. The accumulation lies mainly in the nerve fiber layer and is slightly protruding towards the vitreous body. The blood vessels traversing this focus are not dilated and mostly empty; their walls, especially the endothelial cells, show no pathologic changes. There is absolutely no outlining of the focus by red blood cells. In its periphery little lymphocytic conglomerates are encountered which in almost every instance surround the undilated blood vessels. There is, furthermore, a very similar but much larger accumulation of medium sized lymphocytes in the macular region; in its central part there is a hemorrhage. Hypertrophic varicosities of nerve fibers, glia hypertrophy, and small perivascular lymphocytic aggregations are also found here and there. Small hemorrhages with very few leucocytes are disseminated almost through the whole retina, and even in some places in the subretinal space. The central blood vessels on the papilla, too, are surrounded, mantle-like, by lymphocytes, while behind the lamina cribrosa not a trace of these lymphocytic aggregations can be found. The choroid, also, shows in its posterior part a moderate extravascular infiltration with medium sized lymphocytes. Its blood vessels are not dilated and mostly empty. Numerous vesicles of varying sizes are found on the ciliary body. Their walls are formed by flattened epithelial cells. These vesicles contain very little of a coagulated material. The optic nerve is free from pathologic changes. Iris and cornea, too, appear normal. There are slight lymphocytic accumulations in the episcleral and orbital tissue which in the main surround the blood vessels.

The right eye shows in general the same alterations, but the accumulation of lymphocytes in the retina is much smaller and appears in single patches and never in a tumor-like swelling. The lymphocytic accumulation in the choroid, however, is much more pronounced, so that in the most posterior and thickest part it is about three times as thick as in the normal. In the infiltration here and there a small hemorrhage is found. The blood vessels are not dilated and show nothing pathologic. On the ciliary body the same vesicles are found as in the right eye. Iris and cornea and the optic nerve are unaltered.

E. C. E.

Postciliary Scleral Trephining for Glaucoma.

EWING, E. E. (*The American Journal of Ophthalmology*, July, 1917). Trephining the sclera behind the ciliary body for glaucoma suggested itself to Ewing for the following reasons:

1. In eyes that have been enucleated because of advanced glaucoma and fixed for pathologic investigation, the sections nearly always show a space between the sclera and the choroid in the region of the ora serrata.
2. In glaucomatous eyes with scleral ectasia the distension is usually in the region of the ora serrata, or just anterior to it.
3. Birnbacher and Czermack (*Graefe's Archiv. fuer Ophthalmologie*, Vol. 32, No. 2, pp. 1-146, 1886), and Mattice (*Archives of Ophthalmology*, Vol. 42, p. 612) have demonstrated that in the incipiency of the scleral staphyloma, or ectasia, there is a space between the sclera and the choroid,

the choroid being normally continuous, and the sclera elevated.

4. In nonperforating injuries to the globe, accompanied by rupture of the choroid, the choroid heals and makes no future trouble.

5. In cases where bits of steel have been removed from the vitreous through the sclera, posterior to the ciliary muscle, the globe has become soft following the puncture, and the wounds have healed kindly and permanently.

6. In eyes trephined for retinal detachment the eyes have healed, apparently without damage to the choroid or the retina; and the trephine openings, months afterward, have given no evidence of occlusion by scar tissue, being readily visible through the overlying conjunctiva.

7. The operation can be performed with practically no pressure on the globe that might provoke deep hemorrhage.

8. The scleral wound can be fully protected with a conjunctival flap.

9. Many eminent ophthalmic surgeons stab the sclera posterior to the ciliary region in operating for glaucoma, with the purpose of reducing the tension, before proceeding with the iridectomy.

The operation had been previously done by Argyll-Robertson and Froehlich, and was performed by Ewing with a two millimeter Elliot trephine, the wounds being located in the neutral region between the superior and the external recti muscles, beneath eight millimeter conjunctival flaps raised from below. In one case the trephine was placed seven millimeters behind the limbus, and in the other nine millimeters. Local anesthesia was used. In one case a small amount of vitreous was lost. In all, five cases are reported, the results as to tension, pain, vision and fields are satisfactory. Several of the eyes were blind, but have been made comfortable by the procedure. The objections to the operation are insufficient drainage and liability to choroiditis. It seems that a drainage is established between the suprachoroidal space and the subconjunctival space by means of the trephine wound.

The points in favor of the operation are:

1. The ease and lack of trauma with which it may be performed.

2. The slow drainage and protection by the choroid against sudden deep hemorrhage.
3. No deformity to the pupil.
4. No deformity to the sclerocorneal margin.
5. Little risk of injury to the lens.
6. Complete protection of the wound by the eyelid against future necrosis or infection.
7. Positive thinning of the sclera to act as a protective expansion drum in future glaucomatous exacerbations.
8. Repetition elsewhere in the globe if necessary.

E. C. E.

Eye Strain and Its Relation to Reflex Nervous Troubles.

SCOTT, LEWIS M. (*Southern Medical Journal,* September 1, 1917), thinks that eye strain due to errors of refraction, and muscle imbalance is responsible for many reflex nervous affections, such as headaches, vertigo, facial chorea, choreic movements of the diaphragm and muscles of the neck and throat, indigestion, flatulency and nausea. He thinks that at least fifty per cent of the cases of headache are due to refractive errors or muscle imbalance, and thinks that the other conditions mentioned are so frequently due to eye strain that this possibility should be earnestly considered.

He thinks that the general public should be educated away from optometrists, and that ophthalmologists should adopt a uniform method of refracting. E. C. E.

Conical Cornea or Anterior Myopia.

JACKSON, EDWARD (*Journal American Medical Association,* September 8, 1917), thinks that conditions of lowered general nutrition are more concerned in the causation of anterior myopia than are near eye work and astigmatism. All cases which he has investigated give a history of previous severe impairment of nutrition, such as secondary anemia and febrile diseases. The cornea is usually thinned at the apex, and is doubtless softened. The myopia is largely of curvature rather than axial. The bulging is almost always excentric, and is usually below and to the nasal side of the center of the cornea. The tests with lenses are very variable, and the shadow tests and the ophthalmometer give little help in the selection of glasses.

For treatment he advises the use of the best correcting glasses, avoidance of lid pressure, build up nutrition, myotics, and the avoidance of bandages. E. C. E.

Why a Cycloplegic or Mydriatic as a Routine?

CRAWFORD, J. M. (*Southern Medical Journal*, September 1, 1917). Crawford sent the following questions to ninety ophthalmologists:

1. Is it your custom to use a cycloplegic in your refraction?
2. In what proportion of your refraction cases do you use a cycloplegic?
3. Do you consider a cycloplegic essential to a proper diagnosis?
4. Do you use a cycloplegic in patients over thirty years of age?
5. What cycloplegic is your preference?

Seventy answers were received, and of those answering, ninety per cent use a cycloplegic in their refraction. Of the remaining seven ophthalmologists, five use a cycloplegic occasionally. Most of those who use cycloplegics use atropin in children and homatropin in adults up to forty years. A few prefer scopolamin. E. C. E.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

M. W. FREDERICK, M. D.,

SAN FRANCISCO.

JESSE S. WYLER, M. D.,

CINCINNATI.

A Plea for a Thorough Ophthalmoscopic Examination Before Employing the Newer Arsenical Preparations.

BLANCO, T. (Necessité de l'examen ophtalmoscopique avant l'emploi des nouvelles préparations arsénicales, *Arch. d'Ophtalmologie,* Vol. 35, March-April, 1917, p. 478). Although the ocular accidents have grown less frequent since the newer and less toxic arsenical preparations have come into general use, they are still in evidence, and the views as to the rôle played in them by arsenic are still at variance.

De Maria and Doods hold that optic neuritis and oculomotor paralyses are quite frequent and precocious, and that their occurrence should be prevented as much as possible by early control. That when they become manifest after the use of the arsenical preparations they were already in onset, and that the arsenical preparations did not cause them, but did not prevent their appearance.

In support of this opinion Blanco cites the experience of Antonelli and Morax, who found a mild neuritis in a number of patients who did not complain of their eyes and were about to receive arsenical treatment. Blanco has had a similar experience.

If the neuritis occurs after the use of arsenic it is still supposed to be luetic by many observers, but in some cases the neuritis has occurred in patients receiving arsenic for diseases other than syphilis. The recovery of patients with neuritis after a mercurial treatment would seem to some to prove the syphilitic nature of the neuritis, but the aggravation of the condition after repeated injection makes Arganaraz, of Buenos Aires, warn us against the use of arsenical preparations in cases of neuritis optica.

Mansilla holds that arsenic should not be used when there are fundus changes or increased tension; in these cases, as in hereditary syphilis, the classical treatment is better.

All patients should be subjected to a thorough ocular, renal, and hepatic examination before proceeding with arsenic, and the slightest abnormality should put patient and physician on guard against the aggravation of a condition of which the patient may not have been aware, but which may become very serious. M. W. F.

The Ophthalmologic Department in the Ambulance Service at the Front.

Lacroix, A., Bordeaux (Notes sur le functionnement d'un service ophtalmologique dans les ambulances de l'avant, *Arch. d'Ophtalmologie,* Vol. 35, March-April, 1917, p. 482). A rather lengthy article, the gist of which is that by far the greater part of the ambulance work is of a minor nature, such as refitting soldiers who have lost their glasses, removing small foreign bodies, opening chalazia, etc. The relative number of eye cases, however, one hundred and fifty-five out of a total of two hundred and thiry-one, proves the necessity of this branch of medical service; and when one considers that twenty-one of the eye cases were of a serious nature, giving a percentage of ten of the total number of wounded, one gets a much higher percentage than ever prevailed in any previous war. Some of the cases had such poor vision, even after correction, that they did not have sufficient vision for the armed service, and were sent to the rear to do manual labor. The requirements for the armed service are 1/2 for one eye and 1/20 for the other eye, after correction. A myopia of less than eight diopters does not disbar if the vision can be raised to the required limits with correcting lenses. As the author says, even though the vision can be raised to the low requirements, soldiers with such poor uncorrected vision are a menace to themselves and their comrades, as the danger of their losing their glasses is always present.

Of twelve cases brought in with the diagnosis of contusion of the globe, six were of a simple nature; amongst the other six four showed hemorrhage into the vitreous, one a detachment of the retina, and the sixth a fixation of the iris in semi-dilatation.

There were nine cases of penetrating wounds of the globe, with greater or less destruction of the globe. In eight of these an enucleation or evisceration was done at once. One case seemed to promise a result from conservative treatment, as the wound consisted of a tear in the sclera about one and one-half centimeters long, which was sewed. The shell fragment was seen, by radioscopy, to be lying on the superior wall of the maxillary sinus. The cornea was clear, and the eye was quiet when he was sent to the evacuation hospital; four weeks later burning and tearing set in, and the eye was enucleated.

M. W. F.

Corneal Graft With a Pedicle.

TEULIERES AND ORGAUD (Sur un cas de greffe cornéenne à pédicule, *Arch. d'Ophtalmologie,* Vol. 35, March-April, 1917, p. 499). On account of the disappointing results, corneal grafting is seldom resorted to in the human subject. This is especially the case in those dense leucomata following infectious processes, such as hypopyon ulcer. The case reported is of interest because of the peculiar nature of the graft, and of the good result obtained.

A twenty-five-year-old infantryman was struck in the right eye by a shell fragment. The shell did not penetrate the eye, but plowed up the central part of the cornea almost to the membrane of Descemet, leaving a flap of corneal tissue six millimeters long by three wide adhering to the region of the internal limbus between two and four o'clock. The injury had occurred twenty-eight days previously, and the flap was much thickened, infiltrated and opaque. It was freely mobile. There was a slight hernia of the remaining corneal layers in the wound, and the wound surface was slightly opalescent, as though there were a thin epithelial covering forming. The edges of the flap and wound were clean cut, and there was not a trace of infection.

After separating the conjunctiva from the cornea by a circular cut the conjunctiva was detached from the globe as far as possible, especially upwards. The graft was carefully replaced and the conjunctiva slid down over the graft until the upper edge of the conjunctiva was on a level with the lower edge of the cornea, where it was sewed to the lower conjunctival lip. Two episcleral sutures were placed at four and eight o'clock, to insure the holding of the conjunctival sutures. Both eyes were bandaged for four days. One stitch gave way on the seventh day, and the others were removed three days later. The graft had adhered perfectly.

Eighteen days later the conjunctiva was completely retracted. The flap was still adherent. Vaporizations and instillations of yellow ointment were given. The clearing of the flap was progressive, so that seven weeks after the operation the visual acuity had risen from hand movements to 1/25. A month later the infiltration had completely disappeared, the flap had flattened out so that it was on the same level with the surrounding corneal tissue, and the external tip presented a very slight opacity. The authors think the clearing of the cornea will continue. The patient was a German soldier.

M. W. F.

Traumatic Subluxation of the Crystalline Lens.

FRENKEL, HENRI, chief of the ophthalmic center of the seventeenth region (Sur la subluxation du cristallin d'origine traumatique, *Arch. d'Ophtalmologie,* Vol. 35, November-December, 1916, p. 327), calls attention to the fact that the subluxation of the lens is often overlooked, especially in the nonperforating traumata of the eye. In the perforating traumata the other injuries are frequently of such magnitude as to entirely overshadow any displacement of the lens. He gives in detail two cases of nonperforating trauma which had passed through the hands of several oculists without the dislocation being recognized, and states that this oversight occurs frequently in cases of "traumatic syndrome of the anterior segment." Frenkel has often diagnosed the subluxation from the history of the case; whenever he found traumatic cataract and iridodialysis mentioned, he found the subluxation on examining the eye. It is easy to understand that a trauma which is sufficient to produce cataract and to tear the iris will not leave the zonula of Zinn intact. Since Frenkel has called attention to this point the number of dislocations diagnosed by himself and others has increased from two to seven per cent of the total of eye injuries. The diagnosis is facilitated by the presence of tears of the iris, or iridodialysis with partial lenticular opacities. M. W. F.

Glaucoma Following Discission for Secondary Cataract.

MENACHO, Barcelona (Le glaucome consécutif à la discission de la cataracte secondaire, *Arch. d'Ophtalmologie*, Vol. 35, No. 6, November-December, 1916, p. 321). The author in his long practice has seen very few cases of glaucoma following discission, but recently had two cases in two men of the same type, with the sole difference that one was an emmetrope and the other a myope. Both had received a preliminary iridectomy followed by massage (which did nothing towards ripening the cataracts), then the lenses were extracted, and a discission done a fortnight later. In both atropin was instilled before and after the discission. Six hours later the glaucomatous symptoms set in. In one case the repeated instillations of eserin dispelled the glaucomatous symptoms; but in the other retinal hemorrhages made their appearance, and after trying leeches, ergot, and a subconjunctival sclerotomy, it was found necessary to enlarge the anterior iridectomy.

The author denies that the discission through the limbus could have been responsible for the hypertension, and does not accept the theory of Raehlman, that the voiding of the aqueous causes an increase in the amount of albumin (globulin) in the anterior chamber, which then blocks the spaces of Fontana, as applicable in these cases, as his discissions were performed without loss of aqueous. He reasons that the trauma of the operation brings on a nervous reflex revealing itself as a lack of equilibrium of the circulation of the endocular lymph, which manifests itself by hypertension. He also ridicules the idea that doing the discission too soon might have been the cause, as he saw de Wecker do many discissions in a shorter interval than fifteen days, and he holds that the earlier they are done the better the results. One might blame the use of atropin, although in twenty-five years he has noted the immunity of aphakous eyes to atropin if there be no enclavement of the iris. M. W. F.

Paralyses of the Cervical Sympathetic From War Injuries.

ROCHE, CHARLES (Les paralysies du sympathique cervical dans les blessures de guerre, *Arch. d'Ophtalmologie*, Vol. 35, No. 6, November-December, 1916, p. 339), enumerates eleven cases of this kind, three of which came under his personal observation. Ordinarily wounds in this region are generally fatal, on account of the proximity of the large vessels. and it was interesting to note how many of those who had suffered a wounding of the cervical sympathetic and escaped death, presented the Claude Bernard-Horner syndrome: slight ptosis, enophthalmus, myosis with conservation of the pupillary reflexes, decreased tension of the globe; add to these vasomotor troubles, disturbances of the transpiratory apparatus, and, in the cases of long standing, trophic disturbances. Very rarely do all these symptoms present themselves in one case. Even with the help of radiography it is impossible to tell whether the nerve trunk or one of the ganglions has been injured, and to measure the etiologic value of the lesion in producing the separate symptoms. Hypotonus did not occur in any of the eleven cases, but the motor symptoms were frequent; thus myosis occurred in all, and enophthalmus in ten of the eleven cases. This does not mean that these are the most frequent in all cases, but rather that they demand recognition, whereas the vasomotor and secretory troubles, causing moderate discomfort only, often escape recognition, and should be sought for in all neck injuries when injuries of the latter class will often be found without the presence of other symptoms. Sometimes symptoms will be found quite a way from the seat of injury: thus one of the cases referred to presented sweating of the thigh on the side of the injury, another exaggerated sweating in the axilla of the same side. Pain was never present in wounds of the sympathetic Neither cocain nor adrenalin had any influence on the myotic pupil.

M. W. F.

Neuritids Due to Nitrophenol.

SOLLIER AND JOUSSET (Névrites nitro-phenolée, *La Clinique Ophtalmologique*, February, 1917) had opportunity to examine many soldiers employed in the manufacture of high explosives. They all suffered from symptoms closely allied to those of a chronic retrobulbar neuritis. Three observations are published.

The first had early paralysis of the brachial plexus with a slow atrophy of the deltoid. The ophthalmic examination gave a visual acuity of 5/10, accommodation paralysis, green blindness and a concentrically contracted field. There was slight edema of the nerve head.

The second case had anesthesia and paralysis in both feet. Acuity of 2/10, with central scotomata for green and yellow, and contracted field and accommodation paralysis with normal pupils.

The third had a bilateral papillitis with acuity of 1/20 in the right eye and 3/10 in the left.

The authors have fifteen analogous cases, but cannot trace the point of entrance of the poison. Perhaps the nitrites, being vasodilators, might be counteracted by the use of a vasoconstrictor. It is well to warn the workers so that they may be on their guard, and have them use masks, gloves and hand disinfection. At the first symptoms the worker should be sent to a specialist, who will decide upon the advisability of giving up the position in the powder industry. J. S. W.

Treatment of Retinal Detachment.

Peyrecave (Du traitement des décollements rétiniens, *La Clinique Ophtalmologique,* February, 1917) has given up for two years all surgical intervention, such as puncture, trephining, electrolysis, etc., and resorted solely to the treatment of Darier. As soon as the diagnosis is made the patient is immobilized in bed with a light pressure bandage, and subconjunctival injections of salt solution are given. The first day one cubic centimeter of gelatin serum with acoin is used. The subsequent injections have increasing doses of twenty per cent sodium chlorid solution added, and these are given twice weekly. In very severe cases the author uses twenty-five injections within three months and by this means is able to report five complete cures and marked improvement in seven other patients. All the detachments were in myopic eyes. Brief histories are given and the results are phenomenal. The author maintains, however, that the injections will not be effective unless the patient remain absolutely quiet in bed, without sitting up or turning on the side. The results make the therapy well worth the trial. J. S. W.

The Abuse of Enucleation.

Dianoux (De l'abus de l'énucleation, *La Clinique Ophtalmologique*, February, 1917) maintains that since the war every penetrating wound, with or without accompanying cyclitis, has been an indication for enucleation as the easiest way. This the writer condemns as unfair to the brave men who are wounded. All means should be exerted to save an eye, even though the vision is lost, and this can be done in a large percentage of cases. Where, because of infection or extended damage, it is necessary to interfere, perform evisceration of the bulb as the safer, easier and better cosmetic operation. Only where the eye is torn to shreds should enucleation be done. J. S. W

War Lessons About Sympathetic Ophthalmia.

Weekers (Les enseignements de la guerre au sujet de l'ophtalmie sympathique, *La Clinique Ophtalmologique*, March, 1917) mentions that the extreme rarity of this disease following injuries is one of the surprises of the war, and in eight hundred wounds of the eye personally treated by the writer not one case developed. Many opinions are expressed as to the reason for this, and the views of Drs. Lapersonne, Morax, Kalt and others are widely divergent. The high percentage of sympathetic ophthalmia in previous wars, and the wide range in the percentage of different authors, is explained by the fact that sympathetic irritation and inflammation are not distinctly separated, and a clear picture of plastic uveitis is rarely given in the description. Therefore, Weekers doubts the high incidence of the disease, as a starting point in his explanation. Hasty enucleation is decried. When an eye is irrevocably lost as to shape and function, then radical measures are indicated at once. But when there is a chance of saving even a sightless bulb, it is of advantage to the patient over the use of an artificial prothesis, and must be considered. If at the end of four to six weeks the ball is still tender, there is still plenty of time to ablate without the constant dread of a sympathetic condition. There has been no case with the typical Fuchs infiltration of the injured eye in less than fifteen days, so that the oculist is perfectly safe in waiting at least for that interval in case of doubt.

When ablation of the eye is decided upon, should evisceration or enucleation be the operation of choice? Cosmetically, the evisceration gives by far the better results. Before the war Roemer and others did not consider exenteration as safe a procedure as enucleation, but Weekers has had such good results that for the past year and a half he has not enucleated. Of course the entire uvea must be removed.

The diminution in the frequency of ophthalmia sympathetica is due, above all, to the rigorous teachings of asepsis and antisepsis in first aid and in the entire course of treatment and operation. No new ideas as to the pathology of the disease have been brought forth. J. S. W.

Salvarsan and Intramine, With Consideration of the Chemotherapy.

McDonagh (Salvarsan et intramine avec réflexions sur la chémotherapie, *La Clinique Ophtalmologique*, April, 1917) amplifies his work published in May, 1916. Salvarsan does not attack the spirochetes directly, but acts by increasing the oxidation of the proteids of the serum and cells which contain them. Reducing agents are necessary to fix the oxygen, and for this purpose intramine (sulphur) is the most powerful agent. Because of its great toxicity the author replaces arsenic with an oxidizing chemical in the form of celloidal mercury. The Wassermann does not show the absence of spirochetes in the organism, only the number and amount of the particular proteid contained in the serum, and so repeated negative tests are often followed shortly by new active lesions. Three cases are cited where the new lesions appearing after a steady treatment with arsenic as an oxidizer, rapidly disappeared when the reducing agent was given.

Colloidal mercury in a free emulsion of one per cent administered to ambulant patients intravenously, causing only a diarrhea and stomatitis which disappear within twenty-four hours after the intramine is used. The writer has found colloidal iodids and intramine are the best antidotes for metallic intoxications. Several examples are given of rapid relief. It was this reaction which caused McDonagh to bring forth his oxidation and reduction theory, especially as many of the arsenical dermatitides resemble those chronic eczemas produced by a too rapid oxidation or the reverse. J. S. W.

Blind Writing in Regular Characters.

CANTONNET (Ecriture d'aveugle en caractères usuels, *La Clinique Ophtalmologique,* March, 1917). Braille is the only blind writing extensively used, and long study is required to master it; besides, it is necessary to write from right to left in order to read in the ordinary way. The average man blinded in the war is ignorant, and it is almost impossible to educate him in Braille for the above reason; therefore, the author has endeavored to make a raised writing in the usual characters. Those with sight can use this writing at the first attempt, intelligent blind with agile fingers learn it in one-half hour, and even the unintelligent learn it within two hours.

The letters, punctuation and figures are exactly like the customary ones. The writing is done with a Braille instrument, but with a different copper reglet, purchasable at a very moderate cost. This reglet has three small grooves for each letter; accordingly, if one presses above, in the middle and bottom of the groove, three dots are made, and with the three grooves nine points are possible. The characters are thus traced to resemble closely those in common usage. Several illustrations clarify the author's meaning. Braille has some advantages over this method, in that it can be used for stenography and music, and is slightly less voluminous, since there are only six points instead of nine. The seeing read the new method faster, the blind are speedier with the Braille. The two methods have their own indications. The blind who know the older method and wish to study seriously, or wish to correspond with people educated in Braille, should use it; while the blind who have yet to learn or who wish to correspond with persons ignorant of blind writing will find the new method of Cantonnet more desirable. J. S. W.

Isolated Paralysis of the Abducens Following a Fracture of the Petrous Bone, With Recovery.

Mardellis (Paralysie isolée de l'oculo-moteur-externe consécutive à une fracture du rocher et suivie de guérison, *La Clinique Ophtalmologique*, March, 1917) reports the case of a farmer, forty years of age, previous history has no bearing, and has always been in good health. In 1913, while unloading a tree trunk of about two hundred kilos, he was caught under the falling stump and his head was violently compressed. The immediate symptoms were profuse hemorrhage from the nose, none from the ears. The eyes were protruding, with subconjunctival ecchymoses, violent headache, but no loss of consciousness. Diplopia and a paralytic squint of the left eye with inability to use the left externus were present from the very first. Smell and hearing were not affected. No areas of facial anesthesia nor symptoms upon the sensory nerves could be demonstrated. The left mastoid region was swollen, as was the right temporal and masseter zone. This showed that the force was exerted between these two points, and the diagnosis of fracture of the tip of the petrous portion of the temporal bone was made. The hemorrhage caught the sixth nerve as it passes over this portion, resulting in the paralysis. Eight months after, resolution was complete, for as the hemorrhage was absorbed the function returned.

The literature of traumatic paralyses of isolated ocular nerves is carefully considered and analogy is drawn to the damage which frequently occurs to the facial nerve in fracture of the base. J. S. W.

Late Results of Enucleation Versus Evisceration.

Dor (Résultats éloignes de l'énucleation et de l'évisceration, *La Clinique Ophtalmologique*, April, 1917) has examined sixty-three one-eyed soldiers as to subjective symptoms upon the part of the remaining eye, such as lacrimation, photophobia, hemeralopia, asthenopia, etc. This was done to decide between the Lyons and Nancy methods, the former surgeons performing enucleation while the latter are firm advocates of evisceration. In forty eviscerated eyes, twenty-one complained of symptoms, while only one of twenty-three enucleated cases had any troubles. Dor, who is a firm believer in complete enucleation, thinks that the presence of the ciliary nerves in the scleral wall is the origin of the sympathetic irritability of the other eye. Therefore, complete removal is advised, with or without the insertion of a paraffin ball or a piece of cartilage according to the method of Carlotti. J. S. W

Contribution to the Study of the Pathology and Treatment of Marginal Blepharitis.

CUÉNOD (Contribution a l'étude de la pathogénie et du traitement de la blépharite ciliare, *La Clinique Ophtalmologique*, April, 1917) divides this disease into the two regular classes, the simple and the ulcerated. The former is caused by a chronic hyperemia of the lid margin, often produced by the diathetic conditions, and followed by a distention of the capillary walls. This is often found in individuals who suffer from frequent irritation of the conjunctiva, either from errors of refraction, obstructed tear passages or vitiated atmosphere. There is present a hypersecretion of the Meibomian and Moll glands. This in turn often causes the complication of Meibomian infarcts and calcium deposits in cases of blepharitis.

The ulcerated form is merely due to a folliculitis produced by a staphylococcic invasion under the excessive secretion found in the simple variety.

The treatment consists in: (1) Combating the atony of the tissues; (2) preventing the general autointoxication, usually alimentary in origin; (3) removal of all local causes of irritation; (4) endeavoring to obtain a vasoconstrictor for the vessels; (5) combating the staphylococcic infection.

As a vasoconstrictor the author advises instillations of adrenalin every two hours for several days, followed by cold compresses. When the staphylococci have become deep seated in the follicles, applications of yellow oxid fail to reach them and no results are obtained. Cuénod epilates under cocain anesthesia the entire ciliary margin and then applies a solution of iodid in acetone (percentages not given), followed by a glycerin dressing, for twenty-four hours. For repeated recurrences he advises the administration of antistaphylococcic vaccine. J. S. W.

ABSTRACTS FROM SPANISH OPHTHALMIC LITERATURE.

BY

WILLIAM H. CRISP, M. D., OPH. D. (COLO.),

DENVER.

Trachoma in Cuba.

PENICHET, J. M. (*Archivos de Oftalmologia,* May, 1917). The incidence of trachoma in Cuba has been variously estimated at from 1.27 per cent to 15 to 25 per cent. The lowest estimate was by Santos Fernandez in 1882 to 1888. The same author revised his estimate in 1889 to 1903 to 3.25 per cent. Penichet himself was responsible in 1911 for the estimate of 15 to 25 per cent. He now feels that he included in this estimate a very large number of cases of conjunctival disturbance not really trachomatous in character, and his present estimate of the incidence of trachoma in the island is from 3.5 to 4 per cent. The remainder of the cases which he formerly included as trachomatous he now explains as representing what he calls acute catarrhal conjunctivitis recurring in a vicious circle. The vicious circle is due to the insanitary conditions in which a large part of the white Cubans live, as a result of which when one member of a family has developed an acute conjunctivitis this is conveyed to other members of the family and subsequently passes to and from the different members of the same family.

In cases of trachoma Penichet has experimented with the vaccination treatment of Demaria, the vaccines being prepared by incubation of excised trachomatous follicles. His results with this method were negative.

Myiasis of the Conjunctiva.

NAVARRETE AND MAS (*Archivos de Oftalmologia,* May, 1917). The patient, a man of twenty-two years, had experienced the sensation of a foreign body in the left eye twenty days previously. Two days before his consultation, the irritation having persisted, he looked in a mirror and discovered the presence of some small maggots beneath the bulbar conjunctiva. At the examination, three maggots were found beneath the bulbar conjunctiva and six beneath that of the superior cul-de-sac. These were removed, the further treatment consisting of the use of mercury oxid ointment. The larvæ were found to belong to the species Rhincestrus nasalis.

Antiglaucomatous Iridosclerectomy.

Cilleruelo, Valladolid (*Archivos de Oftalmologia*, May, 1917). This paper is a criticism of the paper of Castillo y Ruiz, which appeared in the *Archivos* for August, 1916 (The Annals of Ophthalmology, Vol. 25, p. 805). Castillo, who excises a piece of sclera from each lip of the wound, claimed for his procedure that it was simpler than that of Lagrange; but Cilleruelo, who has worked with Lagrange himself, declares that the original operation of Lagrange is simpler than the supposed improvement, which offers no advantage over the earlier operation.

Congenital Vascular Anomalies of the Ocular Fundus.

Menacho, M., Barcelona (*Archivos de Oftalmologia*, May, 1917). Twenty-five drawings illustrate the various congenital vascular anomalies described by the author. These include the following: premature division of the central vessels before emerging from the disc; trifurcation of a venous subdivision in the central depression; arterial bifurcation at an angle of one hundred and sixty-five degrees; subdivision of the vessels in a large, almost complete, excavation of the disc; considerable separation of the central vessels in the optic nerve; coiling of a vein around an artery; "twin" collaterals emerging from opposite sides of the same vessel; division and subdivision of artery and vein in a large excavation of the disc, with exit of the large vessels by perforation of the rim of the disc; peripapillary staphyloma; spiral vessels on the disc; subdivision of the vessels in an inexplorable part of a deep physiologic cup; profuse vascularity; sparse vascularity; cilioretinal vessels; direction of all the vessels toward the nasal side.

Ideal Extraction of

BARRAQUER, IGNACIO (*Archivos*
1917). After reciting the well reco
complications associated with the r
for senile cataract, Barraquer stat
safely prevent loss of vitreous hum
on the eyeball and the use of cutti
eye. This idea constitutes his obj
his procedure of extraction in toto.
and none too definitely describes as
of the cataract is applied a minute c
hold of the cataract and permits its
tion of the suspensory ligament, so
that the act of withdrawing the ins
or any force, is sufficient to extract
lens and its capsule with wonderful
violence to the eye. No compressio
entrance into the eye of another instr

The instrument, which adheres to
of a cup, is mounted at the extremity
which it is possible to establish, gra
vacuum in the cup, the air being as
electric motor.

Angioma of the Conjunctiva of

MARIN, M., Almeria (*Archivos*
1917). The patient was a woman o
years previously she had run a stick
sac of the left conjunctiva. Shortly af
swelling developed between the upper
examination the left upper lid was fc
outer part presenting a rounded pink
a small hazel nut, the palpebral o
almost in its whole length by another
shape of an almond, and dark red in
the eyeball. On turning the eyelid it
swellings were parts of the same tumc
conjunctival cul-de-sac. The tumor
istics of a cavernous angioma. A com

by three treatments with bipolar electrolysis at intervals of about three weeks.

Ocular Sporotrichosis.

LEOZ, G. (*Archivos de Oftalmologia,* June, 1917). Reference is first made to a fatal case seen by the author, in which a diagnosis of sporotrichosis was not made, vigorous antisyphilitic treatment failed to produce any result, and the principal disturbance consisted of the development of multiple gummata in various parts of the head, including the eyes. The second patient was a woman who for four or five years had had multiple destructive lesions of the cornea and scleroconjunctiva. At the time of examination she presented a large number of corneal and conjunctival scars, and a number of minute fleshy tumors on the eyeballs. A Wassermann test was negative, but ignipuncture, followed by the use of potassium iodid in large doses, was followed by complete cure.

The third patient presented himself with some nodular infiltrations of the left cornea and a central leucoma of the right cornea. Under mixed treatment (mercury and iodid) the condition got worse. Four or five crater-shaped ulcerations developed, surmounting fleshy elevations. The submaxillary glands were swollen. The treatment consisted of cleansing instillations of dionin thirty per cent, and iodid of potash in large doses to the point of toleration. In eleven days the patient returned completely cured. The corneal gummata had disappeared, as had also the submaxillary swellings. On account, however, of the heavy doses of the iodid, the patient had discontinued the drug four days before reappearing, and a small conjunctival gumma had developed in the right eye. From this time the gummata multiplied rapidly and almost symmetrically on both sides, being inserted over the attachments of the straight and oblique muscles. The classical treatment with iodid through the digestive tract proving insufficient, intragummatous and subconjunctival injections of the same drug were given (one cubic centimeter of the five per cent watery solution, with five milligrams of acoin) twice weekly as nearly as the patient would tolerate them. After each injection there was an immediate improvement, but recovery from the second outbreak was quite slow, a fact which

the author attributes to the hypers
iodid treatment, with the resultin
the system saturated with the drug.

Repeated attempts to demonstrate
trichum were without success until
from the fluid obtained by incising o
upon the organism was obtained in a
growth.

Acute Catarrhal Conjunctivitis Due

PEREZ, JIMINEZ, Cordoba (*Archi*
1917). The application once daily c
of zinc solution, one and one-half pe
viduals exposed to the contagion, p
phylactic. A like solution was em
tension of the disease from one eye
ment of actual cases was most succ
two and a half per cent of sulphate
ing to observe under the microscop
curred in the conjunctival secretion
number of bacilli rapidly diminishin
of the affected conjunctiva being ra

Two Cases of Double and Serous Irido With Vitiligo

DEMARIA, ENRIQUE B., Buenos A
mologia, July, 1917). In the first p
years, the vitiligo had appeared fou
the past year the skin affection had
hairy scalp, and the eyelids and eyela
ing the same period the first visual di
the eyes becoming injected and mod
vision undergoing progressive dimin
complete blindness in a few months.
as regards syphilis, tuberculosis, rhe
A Wassermann test was negative.
tion the eyeballs were slightly painf
photophobia nor lacrimation, but there
injection, both superficial and deep.
the aqueous humor somewhat cloudy
somewhat diminished, the iris atrop

terior synechias, both crystalline lenses opaque, the tension in both eyes slightly increased, vision limited to light perception. An optical iridectomy done in each eye did not produce any particular benefit.

A previous tuberculin skin test had been negative, but a diagnostic injection of tuberculin produced both a general and a strong local reaction.

In the second case, that of a woman of forty-five years, who for fifteen years had suffered from vitiligo distributed over many parts of the body, there had apparently been a subacute iridochoroiditis beginning six years previously in the left eye and eighteen months previously in the right eye. Vision was progressively reduced to perception of shadows. The condition in both eyes at examination was that of iridocyclochoroiditis with secondary cataract, pupillary seclusion, and atrophy of the iris. In this case the tuberculin reaction was negative but the Wassermann frankly positive. The author therefore believes that in these two cases, where the eye condition might easily have been regarded as depending upon the general condition of vitiligo, the real cause for the eye disease was in the one case tuberculosis and in the other syphilis.

Right Facial Paralysis and Left Optic Atrophy From Traumatism.

Marin Amat, Manuel, Almeria (*Archivos de Oftalmologia,* July, 1917). The patient, a man of fifty-five years, had been felled and rendered unconscious by a blow from a heavy piece of falling timber. There was much hemorrhage from the right ear and the nose at the time of the accident, and marked protrusion of the left eye promptly developed. On recovering consciousness, forty-eight hours later, the patient showed a facial paralysis on the left side. The vision of the left eye steadily diminished, and was completely lost in five days. The ophthalmoscopic picture in this eye was that of complete atrophy of the disc, the blood vessels having a perfectly normal appearance. The condition is explained by the author as resulting from a fracture at the optic foramen with compression of the optic nerve, as regards the eye, and a fracture of the petrous portion of the temporal bone as regards the face, both fractures being the result of a violent blow on the superior maxillary bone.

SOCIETY PROC

CHICAGO OPHTHALMOL

Meeting of October 15, 1917. Dr
dent, in the Chair.

A Case of Hereditary Bilateral Upw With Remarks on Heredi

Dr. Clarence Loeb stated that alth
could not be justly classed among th
festations, it was not seen so frequ
not to excite interest. When it w
panied by any other developmental le
interest. But when the lesion had
a definite hereditary history runni
tions could be obtained, it certainly
put on record.

Miss Z., a graduate nurse, was re
1917, for examination. He found
coloboma, as shown in the drawing w
the right eye the defect was much
The remaining portion of the iris sta
zontal meridian, temporal side, cur
upward to a point on the nasal side,
temporal. By transillumination and
the margins of the lens could be seen
was absent, but the ciliary body co
over, the fundus was absolutely norn

In the left eye the pupil was ext
porally by the coloboma almost to the
corresponding to about two o'clock.
sisted at this location. In this eye als
the fundus.

The right eye was almost amaurotic
of myopic astigmatism, while the vis

quite good after correction of a small amount of myopic astigmatism.

The patient was a very intelligent woman and repeatedly assured the author that wherever the anomaly had appeared in her family, it had partaken of the same character as in her eyes, namely, bilateral, upwards, and more pronounced on the right than on the left. At the author's request the patient obtained a detailed family history.

In this family there were instances of both direct and indirect heredity. Counting each affected parent and his children, whether affected or not, as a separate family, there were seven families containing twenty children, of whom ten, or fifty per cent, were affected. There were two families in which the parents were not affected, and the children were likewise normal. Finally, there was a case of indirect heredity of one child through an unaffected mother.

In an investigation into the subject of hereditary diseases of the eye which the author made in 1908, he was able to collect the histories of fifty-nine families of aniridia or coloboma of the iris. Out of one hundred and fifty-six children, one hundred and sixteen, or seventy-four per cent, were affected. This was a higher percentage than obtained in the family whose history he had just related. In addition, a search through the literature since 1908 had revealed other cases which were cited. If every affected parent was counted with his or her children as a separate family, there were seven families showing a direct heredity. In these families there were twenty-two children, of whom twelve were affected and ten normal. In addition there was one family showing collateral heredity, five children; two affected and three not. He gave statistics of ten families containing thirty children, of whom nineteen were affected, and eleven not affected. If to these were added the families and children in the case he reported, there was a total of seventeen families containing fifty children, of whom twenty-nine were affected, and twenty-one not affected. If the present number of families and children was added to the previous statistics, there were seventy-six families with a total of two hundred and six children, of whom seventy per cent were affected.

It was thus seen that the anomalies of the iris were strongly dominant characteristics, tending to be inherited in about three-fourths of the children of a parent so affected. So far as the essayist knew, there had been no case recorded of the marriage of two parents with coloboma of the iris, consequently no statement could be made as to the effect of such a marriage upon the progeny. In cataract, however, the percentage was sixty per cent in the case of both parents affected, and fifty-eight per cent in the case of only one, practically the same. In retinitis pigmentosa, the percentage was fifty per cent in the case of both parents affected, and 50.6 per cent in the case of only one, again practically the same. However, the number of famliies in both of these diseases where both parents were affected was so small that no definite judgment should be made.

Discussion.—Dr. Francis Lane said that one usually thinks of coloboma of iris in the region of the cleft. After the lenticular vesicle has been formed and is covered with ectodermic structure, and the flask secondary to the vesicle has been born, the mesoderm grows from a portion of the optical vesicle which forms the cornea before the anterior chamber is formed. In this mass of mesoderm there is a slit in the connective tissue which forms the pupillary membrane on one side and the cornea on the other. This takes place before the iris grows out from the root of the ciliary body; then it is in close contact with it if the fissure is closed, but if there is failure of the fissure to close, one can understand why there is coloboma in that region. If there is failure of the separation of mesoderm which grows out later from this root between the lens and cornea, one can understand why coloboma can be situated in any position.

Dr. Loeb, in closing, said the whole subject of the development of coloboma of the iris, the choroid or optic nerve has never been definitely accepted. Many theories have been advanced, but where one gets coloboma of the iris in five generations of the same general character, hereditary influence must play an unusually strong part in bringing about one form of developmental anomaly.

The Management of Squint.

Dr. Robert von der Heydt read a paper on this subject, stating that from his observations on strabismus he would first exclude alternating squint, in which cases there was found good vision and fixation in each eye, but the muscular imbalance of more than usual high degree, thus favoring alternating suppression of the images; also the well understood cases of squint in high hypermetropia where the accommodation necessary to overcome it brought with it an excessive convergence and thus produced a periodical and later a permanent inward squint. These latter cases were promptly corrected by the early adjustment of correcting lenses to be worn constantly, thus correcting the refractive error, bringing about perfect fixation and fusion, therefore stereoscopic vision, and inhibiting the impending development of amblyopia in the converging eye.

It was the other kinds of squint that he wished to consider, the kinds that were less easily handled.

The first three or four years of life presented the critical period in which so much could be done to assist nature in establishing permanent ocular parallelism. This could only be accomplished by a thorough and early study of each case and its possibilities based on a full understanding of the etiologic factors producing them.

About the more obscure cases it might be said in short that any factor present in one eye that retarded the development of fixation or made it less accurate in that eye, as, for instance, anisometropia, monocular high astigmatism, amblyopia or any lowered visual perception in it from any cause, would retard the development of fusion and make it impossible. This in itself, the inability to learn fusion, because of the lowered fixation qualifications of one eye, would not in itself necessarily give rise to a squint; it would only predispose. If, however, there was added thereto in the same pair of eyes a tendency to deviation from any cause, a muscle imbalance, the development of a strabismus was inevitable. Expressed in other words, the visual undervalue of one eye plus a tendency toward deviation would bring about a squint. These cases were common, difficult to handle and, therefore, often neglected. Early attention was most important; delay favored the development of monocular vision, the one eye increasing its visual value by taking the work onto itself, the other learning more and more to suppress, with amblyopia ex anopsia gradually increasing the difference between the two eyes, until nothing more could be done to coax back the reduced visual acuity.

The first step in the proper handling of the case was to win the confidence of the child, so that a careful retinoscopy could be done under a cycloplegic. It was best to introduce the child to the darkroom at the time of the first visit and give a few flashes with the mirror, which proceeding was, as a rule, sufficient to avoid future rebelliousness. When the retinoscope disclosed a sufficient refractive error to reduce visual acuity or hypermetropia calling for several diopters of accommodative effort, glasses should be given.

A period of sufficient length to enable the parents to teach the child the recognition of numerals was now allowed until the next visit. This was done whether glasses were given or not. This enabled one to make accurate records of the visual acuity of each eye, as on this factor was dependent the character of our efforts, and by means of it we might measure progress in the management of the case.

The visual acuity of each eye with and without glasses, also how much that of the better could be reduced by a cycloplegic must constantly be borne in mind for the purpose of intelligently studying the squinting eye, its possibilities, and later the improvement in it. The use of atropin in the good eye to force the use of the mate was an old practice, and the author pleaded only for the recognition of its limitations and its application in the selected number of cases which could be modified by this method. Results could only be obtained if one really forced the use of the bad eye and could only do so if one succeeded in making it temporarily the better eye of the two by the cycloplegic's action on its mate.

What good would it do, for instance, to thus lower the visual acuity of the good eye for a period of months or years, as was often done, if in spite of this blurring it still remained the one with best acuity? Therefore, the necessity of studying the visual acuity of both eyes under various conditions.

If atropinization of the good eye was sufficient to make it the secondary eye, he ordered its use according to the calendar in the following manner: first instance, beginning January 1st a drop twice daily for three weeks, then stop and come in the last week of February. Resume March 1st for three weeks and continue in a like manner. If advisable, he deprived the better eye of its correcting lens during the atropin period and substituted a smoked lens. This called for the use of cycloplegics about half of the time, or even a longer period could be adopted, and made it necessary for the patient to make only six visits per annum. Parents would persevere, as a rule, if one made it reasonably easy for them.

He had in some cases continued the use of monocular cycloplegia beyond the sixth year and during school time ordered homatropin on Saturday and Sunday. If these methods could not be adopted owing to the lower visual value of the squinting eye, some method of occlusion might be tried. He used periodically a hollow black patch with adhesive strips, so arranged that there could be no peeking. A definite schedule was given to be rigidly enforced.

In a case of convergent squint in high hypermetropia existing for one and one-half years with marked amblyopia ex anopsia by the use of atropin in the fixing eye for several years, according to the calendar system outlined before, he had measurably raised the visual acuity of the squinting eye and finally brought about parallelism.

Perseverance and the adoption of a definite system, if the latter did not impose too many duties upon the parents, would lead to surprisingly favorable results in the many cases so often left to permanent strabismus.

Discussion.—Dr. Thomas Faith stated that the essayist began by speaking of fusion, but later spoke more of parallelism than anything else.

There are many cases of squint that are corrected so far as parallelism is concerned, but the other two important things one ought to consider, namely, improvement in vision in the squinting eye and binocular vision, are lost completely.

As to teaching children to recognize numerals, this can be done after a certain period, but in some of the cases that come early the ophthalmologist is obliged to try something else besides teaching numerals in order to obtain a record of vision and be sure whether or not the patients are improving. He has tried some of Worth's ideas, like everyone else who is doing work of this kind. One idea that is particularly valuable is to remove the correcting lens from the fixing eye which is kept under atropin and compel the squinting eye, and if possible ion in the two eyes, with the id the working eye under the condit mind is to get binocular vision if be obtained even with the amblyos squinting eye has begun to impro

Another thing: by the periodica get the squint transferred from th eye, we are likely to succeed.

As to the use of the amblyosco siderable satisfaction and had a Schwarz is responsible for, that amblyoscope at home. He has ap scopes in that way, and after the them, he has taken them back at a r them over to other patients at the does not lose anything, and the pati greatest trouble the ophthalmologi to do what he wants them to do interest in the case aside from si In young children, of two or thre first to put on correction, then mak for the youngsters in having them house with the fixing eye occlude interest children take in it if pare parents can find out what a child i playthings it is fond of, hide them, the fixed eye to find them. By n child is from an object when he r you can obtain an idea what amoun

He has tried to use the little ball not succeeded very well with them exactly what he is looking for all th determining whether he sees enoug round sphere, or whether he guess

He has had something occur in t completely some of the ideas of f vision, and so on, in squint. He h for three years and a half, a child w of age, who has been using the amblyoscope and has developed parallelism, binocular vision and had improved vision in the squinting eye to 20/40 or 20/30. The child was going along nicely, and was for some reason not seen for a year. When he came back, in spite of the fact that he had parallelism, the squinting eye had degenerated in vision to 20/180ths. Still the eye is so perfectly straight that one cannot discern any squint, and at the time he had seen the child a year previously, he was able to fuse with the amblyoscope, and further than that, with a test he showed binocular vision.

Dr. Leigh E. Schwarz stated that he has found in certain cases that a patient can run to the opposite side of the amblyoscope from five to ten degrees and still maintain persistently a certain amount of squint. In one case he reduced the squint to seven degrees, which remained at this point, notwithstanding the fact the patient fused by means of the amblyoscope ten degrees on the opposite side. He thought that was rather remarkable and interesting.

He recalled the case of a patient, three and a half years old when first seen, whom he had under observation for three years. At the beginning the patient had 20/200 in one eye, and 20/70 plus in the other, and twelve months later the patient got 20/30 plus in one eye and 20/30 minus in the other, and has that at present. This case shows what can be done in raising visual acuity.

Dr. von der Heydt, in closing the discussion, stated that his object in bringing up the subject was to emphasize the duty of the ophthalmologist towards these children. It is not enough to refract them, give them glasses, and bless them on their way, but the squinting eye must be followed. How one can measure visual acuity in a young child when it does not know numbers, he could not see. The child should be taught numerals, and the average child, two or three years old, could be taught numbers.

As to the use of the amblyoscope, he could not conceive of one being able to so interest a child of the age mentioned with pictures. One might show children pictures, and many children will see the canary bird in the amblyoscope with one eye and nothing with the other. Another child may see the bird cage with the one eye and hardly a bird with the other, and how one can so influence a patient so young to draw a bird into the cage for more than a few times with a child two or three years old, he could not understand. He had never bought an amblyoscope and therefore he was quite neutral as to its value.

The most promising type of cases were evidently those that have, for instance, high astigmatism in one eye.

He thought Dr. Faith tried to differentiate unnecessarily between the ability to develop fusion and parallelism. No doubt, they are two separate and distinct things. If we create parallelism, and fusion does not develop, there is nothing that can be done further except to continue to develop the visual acuity of the bad eye by the methods he outlined in his paper.

The speaker recalled to mind another case of a child two and three-quarters years old, brought to him eight years ago with six and a half diopters of hypermetropia. The parents have refused to give the child glasses. He saw a picture in the papers of how this child had been wonderfully cured on State street recently. One could therefore see what becomes of these children when they are neglected by their parents.

Projection Demonstration of Specimens of Sympathetic Ophthalmia Contrasted With Other Forms of Uveitis.

Dr. E. V. L. Brown presented specimens of three cases of sympathetic uveitis seen in this clinic during the past year, one of which followed a trephining, another a rupture of the margin of the cornea after a spontaneous thinning and ectasia, and the last a penetrating injury.

Cases of ordinary fibrinoplastic and suppurative uveitis were shown; also specimens of cases of tuberculosis of the choroidea, discrete tubercles, gummata of the iris, and disseminated chorioretinitis from acquired syphilis.

A Device to Immobilize the Head and Eyelids During Operation on Eyeball.

Dr. E. R. Crossley presented a device for the purpose of immobilizing the head and eyelids during an operation on the eyeball. He stated that many forms of lid specula had been devised for controlling the eyelids during operative procedure on the eyeball, most of which depended upon the force of a spring of some character to retract the lids. All of these devices had their weakness in their frailty and the fact that the patient "can squeeze the eyeball itself" with the lids and actually throw the speculum out of the eye during operation.

With this ordinary form of speculum, the routine procedure before doing a cataract extraction, after placing the patient in position on the table, was to talk to him to get control and his confidence and attempt to exert a hypnotic influence on his mind. If he happened to be a good patient, the surgeon succeeded. If nervous and irritable, as most were, he might roll the head to one side at the critical moment. when the knife was through the anterior chamber, and interfere seriously with the incision or cause the operator to do serious damage to the eye with the knife, if he did not dexterously follow the movement of the head.

The most serious damage might come after the incision was completed and the anterior chamber was open. He might squeeze violently enough to throw out the lens and vitreous through the opening and lose the eye entirely. Then the patient was told that it was his own fault, for he squeezed. This was not a true statement, for the act was largely involuntary on his part, and we, as operators knowing it to be such, were responsible and should take some positive means to control the patient so that such mishaps were impossible.

Undoubtedly this common accident had occurred to all who were doing an extensive amount of this kind of work.

In the presentation of this appliance for the immobilization of the head and eyelids during operations on the eyeball, the author offered a mechanical device that took complete control of the head and eyelids more effectively and efficiently than a trained assistant could possibly do.

With this head clamp and eyelid retractor, the operator could go to his operation with a feeling that no accident was going to occur to detract from his good results, and that he could positively assure his patient that he could not move and injure himself during the operation.

This reassured his mind and inspired confidence in the operator obtaining a perfect control of the situation that was impossible to obtain otherwise.

The apparatus consists of two parts, the base and the superstructure or framework carrying the lid hooks.

The apparatus was described in detail and illustrated with four figures.

Discussion.—Dr. Edward F. Garraghan said that he had practical experience last spring with the use of the apparatus exhibited in a cataract extraction and was surprised to see how efficient it was. There was no movement of the head whatever. He thinks every hospital should have such an apparatus and try it out.

Dr. Thomas O. Edgar, Dixon, Illinois, stated that he recently had the opportunity to use the instrument in connection with the extraction of a cataarct. He had seen Dr. Crossley use it in a number of cases at the infirmary, and in all such instances it immobilized the head and lids and prevented squeezing of the eyeball.

It would be wise to have a little preliminary practice in the adjustment of the apparatus, with particular reference to the carrier for the lid specula, because in the instance in which he used it the head was a little too low, so as to restrict somewhat one's working space. If attention is given to this, that feaure will probably be overcome.

The instrument should be especially valuable to those ophthalmologists who have not a regular and well trained assistant.

Dr. Oliver Tydings said it occurred to him that there was one defect in the instrument exhibited, and that is, the power to control the occipitofrontalis muscle. He could not conceive of any instrument, outside of the human hand, which could control the movement of this muscle in the use of a lid retractor. He asked Dr. Crossley in how many cases he had used it.

Dr. Crossley, in replying to the question as to the length of time he had used the instrument, stated that it had been used since last January. He did not know the exact number of cases in which it had been used. However, it had been used frequently and satisfactorily at the infirmary.

MAJOR H. WORTHINGTON,
Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of October 13, 1917. Dr. J. R. Robinson, presiding.

Subacute Glaucoma.

Dr. E. R. Neeper presented Mrs. W., aged forty-one years, who was first examined September 12, 1917, at which time the vision of the right eye was 20/30 —1, and the vision of the left eye fingers at one foot. Tension by tonometer—right eye, 52, and left eye, 65.

Mrs. W. said the left eye always seemed the weaker, but that it was worse during the past seven years, and especially with each cold. Rhinoscopic examination negative.

There was contraction of the field of vision of the nasal side of both eyes. The vision of the left eye had gradually failed, a cloud seeming to pass in an eclipse-like manner. There has been no ocular pain. In January, 1917, she weighed two hundred pounds and had a blood pressure of 270 systolic. Today she weighs one hundred and sixty-eight pounds and has a blood pressure of 132. The reduction of weight and blood pressure is the result of an obesity treatment combined with massage, diet and medication, prior to her visit to Dr. Neeper.

X-ray examination of the teeth showed an ulcerated tooth in the upper jaw, and when this tooth was extracted a probe was readily passed through the tooth canal into the maxillary sinus.

In February, 1917, on advice of her family physician, an optician gave her +1.25 spherical, and assured her that the cloud before her eyes would disappear. This opinion was also given by her family physician.

Today the vision of the right eye is 15/20 —1 letter, and the vision of the left eye fingers at seventeen feet, using the peripheral portion of the retina. She has been using pilocarpin nitrate locally.

Discussion.—Dr. Melville Black said these cases of glaucoma simplex are very liable to terminate in acute inflammatory glaucoma. The patients are nervous and should not be frightened suddenly, as any sudden shock is liable to precipitate an acute attack. They must be watched. He would prescribe a fresh solution of eserin, one grain to the ounce, and insist on having the patient keep the pupil as small as a pin head.

He mentioned the case of a woman who left San Francisco for Pennsylvania recently. One eye had been blind for twelve years; the other eye developed glaucoma just before she reached Leadville, Colorado. She left the train at Denver with this eye almost blind and extremely painful. He used eserin every five minutes, with massage every half hour. The tension the second day was eighty; the vision was nil. The second day he used massage every three hours and also eserin. As the eye was in a desperate condition he advised a trephining operation, which was duly performed at St. Luke's Hospital. Vision has now improved so that she can count fingers and walk about alone. He believes patients with glaucoma simplex are over a volcano and their condition is liable to become acute and serious at any time.

Dr. William H. Crisp said that he had known that eserin changed its color upon standing, but did not know that it lost its therapeutic effect.

Dr. E. E. McKeown stated that the solution is stable if we use the salicylate instead of the sulphate.

Dr. D. A. Strickler is in favor of the citrate treatment, but Dr. Melville Black said the chemosis of the conjunctiva is very objectionable after any subconjunctival injection, especially if we have to do a trephining operation.

Dr. H. M. Thompson, of Pueblo, spoke of the importance of focal infection in all these cases, and said we neglect the general treatment too much. We should purge, sweat and reduce the blood pressure of all glaucoma patients. This woman's eye was hyperopic and, therefore, predisposed to glaucoma. He referred to the case of a sheep raiser whom he saw some months ago and presented in Denver, before this society, last spring. The eye was badly congested, but, following the removal of the tonsils, the eye was much better. One eye had previously been lost and the other was poor when Dr. Thompson saw this patient. While under treatment with eserin, some medical friend substituted atropin drops, as he assured the patient that he knew what Dr. Thompson was prescribing for him. The atropin was used for about a week. Eserin was used often to bring his vision back to what it had been prior to the use of atropin. Fortunately, the patient did not rapidly lose sight during the week he had used the atropin. Dr. Thompson believes that in this case a tonsil operation had removed the primary focus of infection and that the improvement in his glaucoma was due to this.

Dr. F. R. Spencer referred to Dr. Clark W. Hawley's recent article in one of the ophthalmic journals concerning the treatment of the gastrointestinal tract in cases of glaucoma.

Dr. William H. Crisp stated that he is suspicious of the diagnosis of any case which will tolerate atropin, and he believes these are likely cases of iridocyclitis with increased tension.

Dr. E. E. McKeown emphasized the use of hot applications followed by eserin, as recommended by Dr. L. Webster Fox.

Dr. C. E. Walker also spoke of glaucoma secondary to an iridocyclitis, especially in cases which tolerated atropin. He was always suspicious of the diagnosis of iridocyclitis in such cases.

Dr. Thompson insisted that there could not be any doubt about the diagnosis in this case, as the patient had been too thoroughly studied and examined by too many ophthalmologists.

Dr. J. J. Pattee spoke of the constitutional diathesis as a predisposing factor, and Dr. W. F. Matson referred to the numerous reports and articles upon glaucoma by Treacher Collins.

Dr. E. R. Neeper asked if he should operate upon this case.

Dr. Edward Jackson asked if she has had acute exacerbations, to which Dr. Neeper replied in the negative. Dr. Jackson said if the case is progressive, she sees rings, and vision is failing, he would operate. He would operate upon the left or worse eye first, in order to obtain a clue as to how the eyes will react to a glaucoma operation, before subjecting the right or better eye to the same surgical interference.

Dr. D. A. Strickler spoke of an article by Chisholm, of Baltimore, upon the Japanese pocket stove for applying heat to the eye. This burns a carbon, is light and comfortable for the patient to wear, and is one of the most satisfactory means for applying heat that he knows of.

Dr. F. R. Spencer stated that he had also used this in many ear, nose and throat cases, but had had very limited experience with it in eye cases.

Dr. E. R. Neeper, in closing the discussion, said he had used only pilocarpin nitrate in this case of glaucoma. He likes it better than eserin, although he may at times use eserin. He thinks most cases show focal infection and we should search for this.

Dr. Melville Black spoke of Dr. Posey's article, published ten years ago, in which he stated that pilocarpin is milder than eserin.

Interstitial Keratitis.

Dr. J. A. Patterson presented a boy, aged eleven years, first examined last August. At that time he complained that things looked hazy before the right eye, but he was only conscious of this dimness of vision, as he had neither pain nor photophobia. It was impossible to get a good view of the fundus with the ophthalmoscope, but the left nerve was pale, and the fundus showed the usual pepper and salt appearance of congenital lues. The right cornea showed a decided interstitial keratitis with marked pericorneal injection. There was no history of injury. Vision was improved very slightly with a —3.00 sphere so that he could see close objects a little better; vision of the left eye with a —3.00 sphere, ○ —1.75 cylinder axis 110° equaled 6/9.

The patient is the only child. The mother seems to be a refined woman in perfect health, and, owing to the father's immorality, separated from him years ago. He has since died. Mother has married again, but had not had any children by her second husband.

Recently, the boy was given 1/1000 mg. of T. R. without reaction. A few days afterwards von Pirquet's skin test was decidedly positive. October 6th he was given 1/500 mg. of T. R. subcutaneously with some local reaction. The Wassermann test is positive. Previous to the Wassermann test he was given three doses of 606, consisting of 4/10 gram each time, intravenously. The eye became worse after each dose.

Unguentum hydrargyrum, one dram every other night, has been continued to date.

Discussion.—Dr. Melville Black said he saw this case in consultation, during the meeting of the Colorado State Medical Society, in Colorado Springs, late in September, and advised luetic treatment, as he felt the case was very positively luetic. He stated that it might be advisable to use the tuberculin treatment if Dr. Patterson so desires. The mouth shows typical congenital lues as manifested by the tongue and teeth.

Dr. F. E. Wallace asked how we are to know the importance of lues in a case which has both tuberculosis and syphilis as prominent etiologic factors.

Dr. F. R. Spencer spoke of Dr. Jackson's recent article, read before the Colorado State Medical Society, in which Dr. Jackson quoted extensively from Brown and Irons' work on the etiology of inflammation of the iris, ciliary body, etc. Dr. Spencer emphasized that we must not be misled by lues necessarily, but we must consider these cases on their merit. Many of his own cases have been treated both for syphilis and tuberculosis with good results. In one case the ethmoid had to be operated, too, because of an old ethmoiditis with involvement of the optic nerve on that side.

Diabetic Lenticular Opacities.

Dr. J. R. Robinson presented Mrs. D., with opacities in each lens and diabetes. She has worn plus cylinders with very little if any improvement. She accepts a + .50 sphere for distant vision.

Posterior Synechiæ and Broad Arcus Senilis.

Dr. Robinson also presented Mrs. S., aged fifty-six years, who has large broad posterior synechiæ in the left eye, with poor vision. It is almost impossible to see the fundus because of the haziness of the media, slight lenticular and vitreous opacities. The wide arcus senilis is congenital, and she states that she has had this all her life, and her daughter, who is thirty-two years old, shows the same defect. Dr. Robinson asked for suggestions concerning treatment, subconjunctival injections, etc.

Discussion.—Dr. H. M. Thompson, of Pueblo, uses subconjunctival injections of dionin to break up posterior synechiæ. A marked reaction is necessary.

Dr. Melville Black suggested atropin with dionin. The teeth should be X-rayed, he believes, and one should look for roots, even though she states that all her teeth have been extracted, and even if one cannot find any evidence of roots projecting above the surfaces of the gums. If these things fail, he prefers an iridectomy, but only as a last resort.

Dr. Jackson, in speaking of Dr. Robinson's first case, said the refraction may change. The iritis may cause myopia and the diabetes may also influence refraction decidedly because of the effect it has upon the lens.

In Dr. Robinson's second case, the posterior synechiæ were hardly sufficient to produce secondary glaucoma, as there is too free communication between the anterior and posterior chambers. He would let the eye alone, as the adhesions may become atrophic, especially if the pupil reacts reasonably well to light. These posterior synechiæ stretch considerably during a period of years, at least that has been the experience in other cases that he has had an opportunity to watch for a long time. As this woman is older, one will have less opportunity to expect this as much as in younger patients. He says that the corneal condition is very interesting and the children should be examined. The case should be worked up completely and reported in full. Change in refraction in these cases is due to change in the lens and not to change in the cornea.

Dr. W. H. Crisp said he would not worry about posterior synechiæ, as he does not believe these constitute a serious complication in any event.

Dr. O. Orendorff, of Canon City, spoke of using the keratometer in measuring the astigmatism in these cases. We have in the keratometer a means of watching the corneal curvature and astigmatism, and, if the astigmatism changes from time to time without any change in the reading of the keratometer, we know the change has taken place in the lens. In one patient a diagnosis of impending cataract was made before there were any ophthalmoscopic changes, and after a few months this was easily verified.

Dr. F. R. Spencer spoke of using three tests in all cases of refraction, as suggested by Dr. Edward Jackson in an article read before the Philadelphia Polyclinic several years ago. We should use the keratometer, the subjective test at the trial case, and skiascopy in every case of refraction, under a cycloplegic. In this case we get one clue by one test and another clue by another, but our work is more likely to be thorough and systematic if we depend upon all three tests.

Hemorrhage of Vitreous.

Dr. J. R. Robinson presented a third case: A printer, fifty years of age, from the Old Soldiers' Home, with lues. Complains of sudden loss of vision in his only eye. Upon examination a decided hemorrhage of the vitreous was discovered. Vision is worse from the floaters rising in the vitreous as he moves his head or turns his eye about. Has taken potassium iodid and now reads coarse print. His first attack occurred in 1914.

Discussion.—Dr. F. R. Spencer said the angiosclerosis of the retinal vessels is the cause of the vitreous hemorrhage. The lues has only been a predisposing factor in hastening this, as lues is so liable to produce early arteriosclerosis.

Dr. Melville Black said he would consider retinal tuberculosis.

Dr. Edward Jackson said he saw a red mass below in the lower part of the vitreous chamber.

Divergent Squint.

Dr. E. R. Neeper reported a case in which the patient has divergent squint, although he is hyperopic. The vision of one eye is almost nil. He formerly had convergent squint. He spoke of this case as quite unusual, as most patients who are hyperopic, if they have squint, have convergent strabismus and not divergent, and it does not change its type.

FRANK R. SPENCER,
Secretary.

COLLEGE OF PHYSICIAN
SECTION ON OPHT

Meeting of March 15, 1917. I
Chairman.

Symposium on Ophthalmia Neona
junctivitis, Their Relation to

Dr. George E. de Schweinitz sai
are well acquainted, towit, that abc
children in this country are withi
About one-fourth of this number n
The causes of their misfortune ar
able. These 25,000 persons by t
country yearly of about $8,000,00
A very large proportion of these
not to have lost their sight have l
of ophthalmia neonatorum, which
five or twenty-six per cent of the
institutions, schools for the blind
approximately eight per cent of th
regions of our country. The op
causes this blindness is in most in
cus, which is responsible for this
per cent of the cases. In general t
in operation for the elimination o
blindness are education, compulso
by law of offenders against prop
lations, and compulsory prophyla
discuss the value of these measur
this is not enough. Inasmuch as
pitals at the preesnt time have as
Social Service, the difficulties of t
thalmia neonatorum have been le
system has been productive of ad
the social workers and the follow
able to control home treatment, and
the best results are secured in w

and conducted for the management of this disease, the best example being the Gardiner ward of the Massachusetts General Hospital. But many hospitals have no such wards. Until comparatively recently,* in the city of Philadelphia, the Philadelphia General Hospital and the private rooms of St. Joseph's Hospital were the only places where cases of ophthalmia neonatorum and adult gonorrheal ophthalmia were admitted. In other words, many hospitals had no accommodations for such cases, and have not got them now, and they won't admit them. Some hospitals, like the Preston Retreat, the Maternity Hospital of the University and the Jefferson Medical College, take care of the babies who acquire the disease when born in their own wards, but they do not accept cases of this character from the outside. Dr. Holloway investigated forty-two hospitals in Pennsylvania. Only two returned an unqualified statement that ophthalmia neonatorum patients would be accepted. Very properly he concludes that hospitals receiving State aid should be compelled by law to provide suitable accommodations for the victims of ophthalmia neonatorum. Furthermore, society in the general sense of that term, which supports certain other hospitals not accepting State aid, should demand that they make similar provision. Committees which exist for the prevention of blindness should force this issue with all the influence they can command, not only because it represents a real work of humanity, not only because it relieves the city ward in which the child may exist from a distinct menace, not only because with very little expense and with absolutely no danger to other patients in the hospital, a room with a few beds could always be appropriated for these cases and a nurse detailed when any of the patients were its residents, but, if you choose, from a commercial standpoint the matter should be urged, because it would mean a reduction of the blind from this cause, and therefore a lessening of the economic loss to the commonwealth in which these hospitals exist. Many computations have been made. In one State it has been ascertained that one hundred of the young blind have lost their sight from ophthalmia neonatorum. These young persons will eventually cost the State $300,000 for education, but the economic loss to the commonwealth because of their lifelong dependence will be many times that sum. Three years ago in the State of Pennsylvania $123,000 was appropriated by the commonwealth to four institutions or organizations for the blind, and approximately $32,000 of this money was devoted to the welfare of those who were blind from ophthalmia neonatorum. As Dr. Holloway has pointed out in his admirable report, it costs the State of Pennsylvania approximately ten times as much to educate one blind child as it does to educate one seeing child. These figures should be stored up in the memories of those who make our laws.

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*At present several hospitals have made provision, for example the German Hospital, St. Mary's Hospital, and the Children's Hospital.

Dr. A. D. Whiting, medical executive officer of the Germantown Hospital, said that gonorrheal ophthalmia and ophthalmia neonatorum are classed by the management of a general hospital as infectious, venereal diseases. Hence they come under the ban of the rule of most general hospitals which provides that no infectious or contagious disease shall be admitted; or under the ban of the rule which prohibits the admission of venereal diseases. These are just rules when applied to the majority of general hospitals and should be enforced, because these hospitals are not equipped to properly care for these cases without neglecting or endangering the patients generally considered suitable for admission to a general hospital. A general hospital is supposed to be equipped to properly study, treat, and care for patients afflicted with conditions which in a general ward would not endanger the comfort or well-being of other patients admitted to such wards. They are not equipped, in a majority of instances, to properly study, treat, and care for patients suffering from communicable diseases which require isolation with all that the term applies in the form of special, exclusive nursing; special, exclusive diet trays with the care of the tray utensils; special, exclusive disinfection and laundering. If not properly equipped, the hospital does an injustice not only to itself by admitting such cases, but an injustice to the other patients in the hospital and to the community in general, because it would be assuming obligations which it could not fulfil; it would result in removing from the other patients that protection against communicable diseases which is assumed when they enter a general hospital.

As a general proposition, the nursing staff of a general hospital should be equipped both as to numbers and attainments to care properly for each and every case admitted to the hospital. But the majority of hospitals have nursing staffs that are not prepared, especially in numbers, to care for cases that must be isolated, without either neglecting really suitable cases, or being so overworked that the general nursing deteriorates. And this is especially so when a case of gonorrheal ophthalmia is considered. According to some authorities the infection reaches its height in about two weeks. During that time there must be practically constant attention, both day and night. This means that at least two nurses must be taken from their regular duties and must devote themselves solely to the one case. One might imagine that the removal of two nurses from regular staff duty should not interfere with the routine work of the hospital. As a matter of fact, very few, if any, hospitals have a greater number on their nursing staff than is actually required to do the routine work. Again, it may be argued that the hospital would have to care for a case of gonorrheal ophthalmia which developed in the hospital. Very true. And the hospital would care for such a case to the best of its ability, hiring special nurses for the purpose if necessary. But that does not signify that the hospital should seek trouble and expense by admitting a case, for the care and treatment of which it is not equipped.

Another drawback to the admission of these cases, in most general hospitals, is the lack of isolating wards or rooms. If these cases could be cared for in a general ward, there would be a greater leniency toward admitting them. The hospital must protect the other patients from infection, so far as possible, and therefore the management must refuse admission until proper housing facilities can be afforded.

A very serious objection to the admission of gonorrheal ophthalmia to a general hospital, in the minds of the lay management, is the thought that it is a venereal disease. Possibly it will be argued that this stand of the management is due to prejudice or ignorance or both. Be that as it may, it is nevertheless a fact that a great many hospital managements hold the

same views. Stokes states that in
the city of London, with a popul
hundred and sixty-three beds act
of sexual diseases. The Sydenh
just found the same condition thr
thirty general hospitals in New Y
tion showed that only ten receive
in active stages. Nine receive ad
ing hospital attention, and three re
rhea in little girls. Thirteen of
medical cases with known syphili
prejudice, ignorance, or whatever
come, lay managements will conti
eases. It must be remembered,
mind, venereal·diseases are loat
many managers think it almost c
command, young pupil nurses to
loathsomeness even in a professio

The only general hospitals that s
rheal ophthalmia are those that ha
department, sufficient and suitable
enough nursing staff to allow of s
fering with the routine work of
hospital.

I believe that every general hos
an eye service should be so equi
gonorrheal ophthalmia should be
ment.

Dr. A. A. Cairns, Chief Medical
Health of Philadelphia, called atte
bly No. 295, approved June 5, 191
prevention of blindness, by requiri
ophthalmia neonatorum (inflamma
by physicians, midwives and others
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a penalty for violation thereof.

The reporting of ophthalmia ne
thirty-seven States.

He felt that there was no good re
mia neonatorum should not be trea

The Division of Child Hygiene, Bureau of Health, dispenses to all midwives ampoules containing one per cent solution of nitrate of silver.

Dr. Cairns stated that any case of ophthalmia neonatorum reported to the office of the Bureau of Health (which was always open) would be visited by a medical inspector who would explain the gravity of the disease to the parents and endeavor to have the case removed to a hospital.

Dr. J. M. Baldy, chairman of the Bureau of Medical Education and Licensure of Pennsylvania, said that his interest in this matter was purely from an administrative standpoint.

Several years ago he was called from his office during the evening by the supervisor of midwives of the Philadelphia district to the house of a young Italian family where he found a young mother with a first baby on her knees which was suffering from the well-known picture of ophthalmia neonatorum. The only hospital in Philadelphia available into which to send this child and mother for treatment was the Philadelphia General Hospital. The district physician through whom application was to be made was out of town for the night and there was no certainty that he would be home even in the morning.

Such a condition in a city of the size of Philadelphia Dr. Baldy thought not only pitiable but outrageous. If hospitals were not organized to take care of suffering people, no matter what the disease might be, then he did not know what a hospital was for. The only exception to this should be cases which had been pronounced by the health authorities to be so contagious as to be unsafe for treatment in a general hospital.

The Bureau of Medical Education and Licensure during its inspections of the hospitals of the State found it the almost universal rule to exclude all of this type of cases. This was frequently done by specific by-laws. The spirit of excluding this type of case from the general hospitals had grown from several causes. First from the lack of proper information given by the doctors to boards of managers, and second from a religious prejudice of the boards of managers. The old conception was that if a man sinned he should stand the consequence of his sin; but the trouble with this theory was that it did not take into consideration either humanitarianism, the efficiency of the community or the rights of the innocent. No more dangerous class of diseases exist to any community than this group of venereal diseases, and no hospital manager can with a clear conscience turn such cases loose on the community. The hospital which commits this offense clearly fails to fulfill its obligations to the community and to those who contribute charity funds for the sake of the sick and distressed.

So far as purulent ophthalmia is concerned, the State builds institutions for housing these unfortunates after they have become blind and spends large sums in educating them and caring for them, and yet this same State is asked to contribute millions of dollars a year to the aid of hospitals which turn loose this class of patients on the community to become blind and to become dependent on the State.

The Bureau of Medical Education and Licensure had weighed this matter very carefully and Dr. Baldy was glad to hear that the opinion of those present who were experts in the treatment of the eye was thoroughly in accord with his opinion as to the responsibility of hospitals in this matter. He said that this discussion had strengthened the Bureau in a conclusion to which it had already come and which it was about ready to announce, towit, that no young medical man was properly prepared to practice his profession who was not properly educated in the treatment of venereal disease in all of its phases, including purulent ophthalmia and vaginitis; that it was unjust to the community to turn such young medical men out without this education, when the State required that each young man who went into practice shall spend a year in a hospital. It was fairly evident that unless the hospital furnish instruction in this class of diseases he could not acquire a sufficiently competent education to warrant his being sent into practice in a community. In consequence of this it would be found when the new hospital bulletin was issued that the Bureau would insist that the hospital which was unwilling hereafter to furnish material for such experience to the intern would not be placed on the approved list of hospitals into which interns might go to complete their education.

Dr. Love, on behalf of St. Mary's Hospital, and representing the ophthalmic department of that institution, said he wished to state that a ward has been assigned to cases of ophthalmia neonatorum and of gonorrheal ophthalmia. This ward was isolated, contained six beds, and was in charge of two nurses.

He believed that the number of these cases could be greatly reduced, and the eyesight of many children be saved, if the law relating to this subject were more rigidly enforced, and if ampoules containing silver nitrate were widely and freely distributed by the Bureau of Health.

Dr. H. Maxwell Langdon stated that the Children's Hospital would take care of gonorrheal ophthalmia in children either with or without vaginitis up to the limit of its capacity, which was a ward of four beds to be used for this purpose. These facilities might be somewhat curtailed for the immediate future from the fact that in the new hospital the quarters for the nursing staff were limited and it might be that owing to a shortage of nurses not more than two cases could be treated at one time.

Dr. J. B. Turner endorsed the sentiment of the meeting, that hospitals receiving State aid should admit cases of ophthalmia neonatorum. Also that children's homes and foundling asylums should report their cases and be compelled to have trained nurses for the care of the same, under an oculist's supervision. If the mother was given an antiseptic vaginal injection under strict antiseptic precautions before birth of the child there would be fewer cases of ophthalmia neonatorum to report.

Meeting of April 19, 1917. Dr. William T. Shoemaker, Chairman.

Extensive Discoloration of the Posterior Capsule of the Lens Following a Severe Penetrating Wound of the Eye, Resulting in Excellent Vision.

Dr. Frederick Krauss presented a patient, male, aged thirty-five years, who was struck by a red-hot piece of steel about two inches long and the thickness of a narrow lead pencil, which penetrated the tissues just beyond the outer canthus, passing through the ciliary region, then apparently between the posterior capsule of the lens and the limiting membrane of the vitreous, reaching to the opposite side of the lens. The patient immediately pulled out the h his fingers. He made a perfect recov he had 5/9 normal vision. He showe outer canthus, two triangular discol body and a brownish, rust colored, running across the entire lower fifth discoloration in the outer third of th lens and vitreous were clear, and th was negative.

Retained Hyaloid S

Dr. Wm. Zentmayer presented a sheath in the right eye of a boy, aged the upper inner quadrant of the post was a white membrane which could tance into the vitreous when it was, f again became visible as a broad green to the papilla. The latter appeared coloboma. The eye was blind.

Congenital Stellate Ca

Dr. Wm. Zentmayer presented an genital cataract. The case was that cataracts presenting stellate opacities clouded zone.

Dr. Zentmayer also presented two in subcapsular, punctate, annular opaciti terior capsule of the lens.

Snowball Opacities of the

Dr. Holloway exhibited a female, a who recently came under observation pital on the service of Dr. de Schwei whole vitreous appeared to be studd movable, small, snow-white globular incipient lens changes. The fundus of clearly but sufficiently well to state th defined gross changes in the choroid c is now being studied from a general m

Dr. Holloway briefly alluded to som

the subject. In conclusion he stated that he had not made a complete résumé of all cases showing cholesterin, but had alluded to these cases because cholesterin crystals, more closely than any other opacities, bore resemblance to the type of opacity under discussion. He felt that they differed in appearance just as much as a cotton ball differs from gold and silver tinsel.

He referred to the investigations of Burdon-Cooper, who repeatedly found tyrosin in association with cataract, and especially marked in those cases associated with albuminuria and diabetes.

Discussion.—Dr. Zentmayer said that from the casual examination that he had made of Dr. Holloway's case the condition did not seem to him to differ greatly from synchysis scintillans. The bodies were in the anterior part of the vitreous and were enmeshed in a framework of connective tissue.

Dr. S. Lewis Ziegler had seen several such cases during the past thirty years. He referred to one case of occlusion of the pupil in which after a V-shaped iridotomy the anterior chamber filled with cholesterin crystals. He thought that some chemical change was responsible for these vitreous opacities with associated systemic disturbance.

Report of a Case of Acute Double Optic Neuritis With Complete Blindness in the Right Eye.

Dr. C. E. G. Shannon presented the case of a girl, aged nine years, who had consulted a physician a few weeks previous for severe frontal headaches and was informed that the sight in the right eye was completely lost.

Examination.—Right eye blind. Left eye vision equals 20/30. Pupils were unequal—O. D. 4½ mm.—O. S. 4 mm. Reactions normal. Malingering was disproved. There was no impairment in the rotation of eyeball.

Ophthalmoscopic Examination.—Right eye revealed swelling of the papilla of about 3 D. associated with a grayish striated opacity extending some distance into the surrounding retina. Margins decidedly indistinct. Arteries normal. Veins engorged and tortuous.

Left eye showed swelling of ner retina slightly less marked than O. I

For future study and observation, Jefferson Hospital, November 15, 1

Personal History Negative.—The negative. Wassermann also negative no clonus; no Babinski; gait norm changes in sensation; finger to nose a ments apparently normal.

Dr. Price said that it suggested ve of brain tumor, the absence of definit mental hebetude inclining him to thi

Dr. Deardoff reported chronically adenoids, but considered these affectio the symptoms.

Urinalysis.—Negative.

The X-ray demonstrated marked pressure by reason of the exaggerated on the inner table of the skull, althou the increased pressure can be determi

Dr. Hansell saw the patient in c lumbar puncture.

Dr. Tyson, the intern in charge, p and reported that the cerebrospinal f erable pressure because of the force from the needle.

Microscopic examination of fluid ne

On the morning following the punc right eye, and the child could count fin was a slight reduction of the swelling margins were more definitely outline proved and within two weeks had incr ciated with the improvement there was of the papillary swelling to about 1½ of 20/100 with moderate elevation of tained.

Diagnosis.—In view of the negative f tory, the laboratory findings, and the following lumbar puncture, the diagno certain.

The report of the X-ray demonstrating exaggerated convolution markings on the inner wall of the skull, and the evolution of the spinal fluid at the time of lumbar puncture, and finally, by reason of the absence of other signs and symptoms of cranial lesions, a tentative diagnosis of chronic internal hydrocephalus may be assumed.

Discussion.—Dr. Holloway assumed from Dr Shannon's remarks that he regarded the digital impressions as being dependent upon intracranial pressure. He stated that authorities were not in accord concerning the formation of these peculiar markings. He thought that in the case under discussion, if the pressure was intense enough to produce these markings on the inner table of the skull, it might be fair to assume that the delicate bony structure of the posterior wall of the orbit might be affected, and the possibility of some pathologic changes about the optic foramen ought to be considered.

Massive Spontaneous Hemorrhage Into the Vitreous.

Dr. Leighton F. Appleman reported three cases of massive spontaneous hemorrhage into the vitreous observed in Dr. Holloway's clinic in the Polyclinic Hospital. The first case, a woman, aged forty years, had an initial hemorrhage which cleared up under dionin and atropin to such an extent that the details of the fundus could be dimly seen. This was followed one month later by another massive vitreous hemorrhage in the same eye which failed to clear up under increasing doses of potassium iodid or other measures. The Wassermann reaction was negative. She suffered from extensive pyorrhea which was believed to be a causative factor by septic absorption.

The second case, a man, aged twenty-one years, showed a massive vitreous hemorrhage which had come on suddenly, without previous injury, and with complete loss of sight The Wassermann reaction was strongly positive. He was given several injections of arsenobenzol, and potassium iodid, over a period of three months without favorably influencing his eye condition, although his general health was greatly improved.

The third case, a man, aged twenty-seven years, also lost the sight of the left eye suddenly as a result of massive hemorrhage into the vitreous. The right eye showed extensive connective tissue formation in the vitreous, as of old hemorrhage, although the patient was unaware of any trouble in this eye, as his vision was normal. This case was considered specific in nature, as he gave a history of chancre nine years previously, and other findings were negative. The serum Wassermann was negative, however, and a spinal Wassermann was not obtained, as the patient left the hospital before the examinations were completed.

The various cases of vitreous hemorrhage were reviewed, as well as the different modes of treatment which have been resorted to in the hope of absorbing these large extravasations.

Dr. Krauss recalled two cases of spontaneous hemorrhages in the vitreous. The first case had copious hemorrhages which would be completely absorbed, only to recur again after an interval of about six weeks. They apparently came from the choroid, directly above the macula, as shreds of the retina could be seen extending into the vitreous at this point. The patient recovered his sight eventually without any specific treatment, but finally developed miliary tuberculosis.

The second case, a woman in which were frequent hemorrhages, all sorts of local and internal medication proved unavailing, each hemorrhage being more difficult to absorb than the previous one. The remedies recommended for this disease demonstrate their uselessness by their numerical variety.

Dr. Zentmayer recently saw a case of recurrent hemorrhages into the vitreous in a strong boy, age eighteen years. A thorough physical examination failed to reveal any lesion. The blood count, hemoglobin and coagulation time were all normal. The left eye had but L. P. The vitreous was filled with blood. In the right eye vision equaled 6/6. There was but little blood in the vitreous, but there was a zone of hemorrhages in the retina surrounding the ciliary body. Under mercurial inunctions, thyroid extract, potassium iodid and sweating, the vision in the left eye was now 6/9, but that of the right eye contined to fail, new vessels and tissue forming in the vitreous.

Dr. Holloway thought that these cases were always difficult to handle in dispensary practice, and that often it was difficult, for one reason or another, to carry out proper investigations concerning their origin. He felt that the majority of these cases were due to either tuberculosis, syphilis or anemia, although other conditions might produce a similar clinical picture. He stated recently that Dr. Lamb had informed him that he had obtained excellent results from the use of fibrolysin during the active or subsiding stages. Personally he had never used the drug.

Dr. S. Lewis Ziegler referred to several cases of recurrent hemorrhage in the vitreous, some of which were due to constipation and one to vicarious menstruation. He thought many were due to intestinal intoxication. He found thyroid extract in small doses and positive galvanism the most effective form of treatment.

Serum Therapy as Applied to Pneumococcic Infections of the Eye.

Dr. Louis Lehrfeld, by invitation, referred to the announcement by the Rockefeller Institute that the pneumococcus is no longer a single organism but a family of cocci composed of four different species. This had paved the way for extensive research along the lines of serum therapy for each type of microorganism. In the experience of those who have used antipneumococcus serum in the treatment of pneumonia, only the serum of the Type I variety has given conclusive and encouraging results.

If serum therapy can be of value in the treatment of an acute pulmonary disease such as lobar pneumonia, there is every reason to believe that the same treatment could be applied with advantage in the acute inflammatory diseases of the eye caused by the pneumonia germs. The same types which are found in the sputum should also be found in the inflammatory discharges from the eye, caused by the pneumococcus.

The number of organisms procured from the eye in these infections are ofttimes insufficient to obtain proper growth on culture media. The time consumed in securing the proper growth and the time lost by inoculation of the mouse and by awaiting its death for the determination of the type, made it impracticable to await the ultimate diagnosis of type infection in eye conditions, because serious injury might result to the eye if immediate treatment was not instituted. In order to overcome this difficulty it appeared logical to add equal quantities of the sera of all types and to use this mixed treatment, as it were, in order to reach the prevalent type.

The Pneumonia Commission has therefore prepared ampoules of serum of Types I and II in equal quantities for use in eye cases.

The use of antipneumococcus serum in the eye is based solely on the properties of the various sera to agglutinate the organisms of their respective types. The eye merely acts as the test-tube and the serum instilled agglutinates and renders inactive the organisms present. It is precisely the same reaction which takes place in the Widal test for typhoid and the agglutination test for cholera. The determination of the type of pneumococcus is therefore not immediately essential and the "mixed treatment" can be continued until the type has been diagnosed by the proper laboratory tests when the specific serum can be administered.

Local instillation in the cul-de-sacs of the infected eye can only be relied upon in the superficial infections of the globe, since contact of the serum with the organisms in the deeper layers of the cornea and in the chambers of the eye could not take place readily. In such fulminating inflammations of the eye where the deeper structures are involved, it is advisable to use the serum intravenously as in the case of lobar pneumonia. The frequency of the injections will depend entirely upon the nature and seriousness of the infection, and the procedure will follow along the same course as in pulmonary infections.

The advantages to be derived from local serum therapy in the severe pneumococcic infections over the present methods of treatment are the immediate destruction of the invading organisms. Corneal ulcers are most frequently caused by the pneumococcus, and opacities are a common sequel of these infections, leaving the vision more or less permanently impaired. It is for the prevention of these cases of partial blindness that serum therapy is especially advocated and for the possible prevention of total blindness resulting from complete infection of the globe.

Ocular Palsies in Infantile Paralysis. Report of Two Cases.

Dr. A. C. Sautter, after briefly reviewing the literature, reported two cases of ocular palsy complicating infantile paralysis, both cases being patients in the Philadelphia Hospital for Contagious Diseases in the fall of 1916

Case 1.—Bilateral external ophthalmoplegia in a two-year-old male infant. The palsy was first noticed about five weeks after the onset of illness. Before this the patient was in a semistuporous state, at times restless and slightly delirious, fever ranging around 100°. There was slight weakness of arms and lower extremities but no distinct paralysis of any muscle group. Ocular examination revealed paralysis of all external eye muscles with a moderate ptosis in the left eye which slightly deviated upward. There were no pupillary abnormalities and no changes in the eye grounds.

Examination six months later disclosed only slight lateral ocular motility; physical and mental condition apparently good. In view of the exceptionally long duration of the palsy, the prognosis as to complete functional restitution seemed doubtful.

Case 2.—Paralysis of the conjugate movements of the eyes in a four-year-old colored boy. One brother had infantile paralysis at the same time, one sister had succumbed to the affection one week prior to admission of case under consideration. Illness began with vomiting, fever and prostration followed by signs of a right facial paralysis. Five days after admission to the hospital paralysis of the conjugate movements of the eyes to the right was noted associated with right facial palsy and right leg weakness. There were no pupillary or fundus abnormalities. Convergence was somewhat impaired.

Examination six months later disclosed only slight impairment of dextroversion and no other palsies.

The writer reviewed 669 case histories of infantile paralysis at the Philadelphia Hospital for Contagious Diseases and found nineteen, or about three per cent, which showed disturbance of the extraocular muscles, including thirteen cases of unilateral sixth nerve paralysis, four of which were complicated with seventh nerve paralysis. Bilateral sixth nerve involvement occurred in three cases, external ophthalmoplegia and paralysis of the conjugate ocular movements each in one case. Ptosis uncomplicated with other ocular lesions in one case, combined with other ocular lesions in two cases. Nystagmus occurred several times. A few histories containing references only to pupillary anomalies and no other eye symptoms were purposely excluded from the list of eye complications. In seven of the nineteen cases the cranial nerves were apparently the only nerves affected.

Paralysis of the facial nerve occurred in seventy-eight patients, eighteen of whom died.

In the few cases examined ophthalmoscopically no fundus changes were noted.

In accord with the findings of previous investigators it was found that the seventh nerve was most frequently involved, then the sixth and least often the oculomotor nerve.

Discussion.—In reply to Dr. Hansell's question as to what percentage of cases in infantile paralysis showed palsy of the ocular muscles and whether these differed from palsies complicating other cerebrospinal conditions, Dr. Sautter stated the percentage obtained in the case histories examined was about three per cent (excluding facial palsies) and that in his experience, limited to a few cases, the palsies clinically showed nothing typical.

A Case of Suspected Tumor of the Pituitary Body.

Dr. Howard F. Hansell reported the case of a boy, aged seventeen years, who had well marked temporal hemianopsia of the left eye only and slightly concentric contraction of the fields of both eyes. The pupil of the left eye was dilated under all conditions of light 1 mm. larger than the right. The hemianopic pupillary reaction could not be positively proved, yet the response to a bright, suddenly exposed, minute light was less prompt and less excursive by the nasal half than by the temporal half of the iris.

The interior of each eye was normal. There was not the slightest variation from the normal in the color or outline of either optic nerve.

The X-ray report: "Interference by pressure on one or more of the large blood channels, probably that is closest relation to the base of the brain in the region of the sella turcica or longitudinal sinus about the level of the coronal sutures."

Neurologic report: "He has no disturbance of gait, station, reflexes, motion or sensation and presents no evidence whatever of hysteria."

The test by the otologist showed no loss of connection between the internal ear and the higher brain centers.

The symptoms presented by our patient are too few to permit of a positive diagnosis, yet they are of significance in pointing to tumor, cyst or hypertrophy of the ciliary body. The nature of the lesion is conjectural. The picture of normal eye grounds persisting through four months is not inconsistent with the conception of a small tumor, possibly a cyst, which has almost completely destroyed the function of the anterior left part of the chiasm and has invaded, by pressure or inflammation, the right optic nerve.

J. MILTON GRISCOM,
Clerk.

WILLS HOSPITAL OPHTHALMIC SOCIETY.

Meeting of November 5, 1917. Dr. McCluney Radcliffe, Chairman.

Congenital Cataracts.

Dr. P. N. K. Schwenk exhibited a case of congenital cataracts, in a baby boy, in which he removed the lens from each eye. One eye was operated upon at the age of eleven months, and the other at the age of fourteen months. Attempts at discission failed, owing to extreme toughness of lens capsule. He therefore opened the anterior chamber by means of a keratome, grasped the anterior capsule with iris forceps, and delivered the lens in its capsule. Recovery was prompt. Two months later the left eye was treated in a similar manner, but the capsule tore and some cortex remained in the anterior chamber. The recovery was uneventful. Before the operation there was a divergent squint in left eye, but at the age of sixteen months he ordered a +8.00 D. lens for each eye, and, when worn, the visual axes are parallel. This is the youngest child he has ever glassed.

At the present time the left eye shows an occluded pupil and a bowed iris, due to an accident after leaving the hospital.

Discussion.—Dr. Wm. Zentmayer: While this particular case exhibited by Dr. Schwenk admits of no other operative procedure than that employed, the left eye illustrates what may and often does follow the operation of linear extraction of juvenile cataract. Here the result was good in one eye, but in the other eye the adhesion of the iris to the wound was extensive and has produced an inflammation which has rendered the eye visually useless. There is no question of the far greater safety of repeated discission.

In reply to a question of Dr. Kleinhans, Dr. Zentmayer said that he thought the operation should be done early, about the second year.

Probable Cause of Malignant Growth in Antrum.

Dr. Zentmayer exhibited, from the service of Dr. Chance, a woman sixty years old, who had recently noticed a bulging of right eye preceded by nose bleed. There was a firm ridge-like mass palpable just within the inferior orbital margin. There seemed to be slight bulging of internal process of frontal bone on same side. Movements of the globe were somewhat restricted downward and outward. The fundus could not be examined because of immature cataract, which also prevented testing the visual acuity. The patient had just been admitted and was shown for diagnosis. Probably a case of malignant growth in antrum.

Symmetrical Lenticular Opacities in Anterior and Posterior Cortex.

Dr. Zentmayer showed, from the service of Dr. Chance, a girl with symmetrical lenticular opacities in anterior and posterior cortex, and limited to one-eighth circumference of perinuclear zone. They were probably of the annular type.

Bilateral Coloboma of Lower Lids.

Dr. Wm. Campbell Posey presented a case of bilateral coloboma of lower lids. The notch in the right eyelid occurred at junction of middle and outer third, in the left eyelid at junction of middle and inner third. Both superior maxillary bones showed faulty development, in consequence of which the right side of the mouth was drawn markedly upward. The inner halves of both upper lids exhibited colobomatous tendencies, the lid margins in this position being drawn upward in a sweeping curve with its convexity downward. Dr. Posey had corrected the fissure in the right eyelid by a plastic operation. His colleague, Dr. John B. Roberts, of Polyclinic Hospital, had corrected the deformity at angle of mouth. The coloboma in the left eyelid, which was complicated by symblepharon and marked retraction of the tissues of that region, had resisted correction at the first operation. Dr. Posey said he had another method in mind which aimed at correction of the deformity by transplantation of a flap of skin from the root of the nose into the colobomatous area.

Choroiditis Caused by Injury to Sclera.

Dr. Paul J. Pontius presented a case of a boy fifteen years old, who was struck with a shot from an air rifle. The shot struck the sclera of the right eye about ten millimeters to outer side of cornea. The accident occurred ten days ago. Patient was first seen twenty-two hours later. At this examination nothing was seen but the external injury to sclera, which showed as a circular area of hemorrhage two millimeters in diameter. Eight days later bulging occurred over this area. Today the fundus shows a patch of choroiditis beneath the site of scleral wound. The surrounding choroid shows some deep effusion and is slightly elevated. There is, however, no retinal detachment. The disc shows minor early optic neuritic changes.

HAROLD W. HOW,
Secretary.

BOOK REVIEWS.

Manual of Diseases of the Eye.

By Charles H. May, M. D. Published by William Wood & Co., N. Y., 1917.

This is the ninth edition of this well-known and justly appreciated work. It contains 440 pages, with 377 illustrations, including 22 colored plates. Its popularity is well shown by the number of editions, and by the fact that it has been translated into seven foreign languages. C. L.

The Fundus Oculi of Birds.

By Casey Albert Wood, M. D. Published by the Lakeside Press, Chicago.

This work introduces the great majority of oculists to a new world, full of beauty of color and form. It represents years of work on the part of Dr. Wood and those who assisted him in collecting the material and making the drawings. These consist of 145 drawings and 61 colored paintings. These are described in the text which accompanies them. Dr. Wood lays stress on the usefulness of ophthalmoscopic examination of the fundi of birds in the classification and identification of the various species. A chapter is also devoted to the relation of the reptilian to the avian fundus, which is of importance from the standpoint of evolution. It is a work of which the author may well be proud, and no less so American ophthalmology. C. L.

Practical Medicine Series.

Published by the Year Book Publishers, Chicago. Volume 8, 1917, price $1.50. Series 10 volumes, $10.00.

This volume contains a review of the 1916 eye, ear, nose and throat literature. The eye department is in charge of

Dr. Casey A. Wood, and covers 180 pages, with 53 illustrations and one colored plate. Of great interest and very timely are pages 131-164, devoted to military surgery of the eye.

C. L.

Three Clinical Studies in Tuberculous Predisposition.

By W. C. Rivers, M. R. C. S., L. R. C. P., D. P. H. Published, 1917, by George Allen & Unwin, Ltd., 40 Museum street, W. C. London.

The portion of this work which interests oculists is Part II, Consumption and Squint. The author found in five hundred consumptives six cases of squint, and in nine hundred people taken at random on street cars, etc., only four cases, whence he concludes that "there is undoubted association between concomitant strabismus and consumption, of predisposition to which latter disease squint forms a sign." It seems to the reviewer that a more logical method would have been to examine one hundred cases of squint for evidences of tuberculosis. Altogether he has seen thirteen cases of squinting tuberculosis patients, in none of whom was there a family history of squint, although most had a family history of tuberculosis. We cannot see that his conclusions are at all justified as far as squint is concerned.

C. L

THE AMERICAN JOURNAL OF OPHTHALMOLOGY.

This is to be the name of the new journal that will replace

The American Journal of Ophthalmology
The Annals of Ophthalmology
The Ophthalmic Record
Ophthalmology
The Ophthalmic Year Book
Ophthalmic Literature
Anales de Oftalmologia

The last was established by M. Uribe y Troncoso, and published in Mexico for eighteen years.

This name, beside corresponding to that of the *British Journal of Ophthalmology,* formed by the union of all the ophthalmic journals in the British Empire, indicates the representative character that the new journal will strive for and is also the name of the first ophthalmic journal published in America.

In July, 1862, Dr. Julius Homberger published in New York the first number of the *American Journal of Ophthalmology.* It was published bi-monthly. The last number of the first volume, although dated May, seems to have appeared in August, 1863. The first number of the second volume bears the date of January, 1864, and apparently only two numbers of this volume were ever published.

In 1862 the only ophthalmic journals published were the *Annales d'Oculistique,* begun by Cunier in 1838; *Graefe's Archiv fuer Ophthalmologie,* established in 1854; *The Royal London Ophthalmic Hospital Reports,* established in 1857, and the *Reports of the Netherlands Hospital for Eye Patients,* started by Donders in 1858. It was in 1862 that Zehender began to issue the *Klinische Monatsblaetter fuer Augenheilkunde,* and in the same year that Laurence and Windsor started the first *Ophthalmic Review,* which was published for about four years in London.

In 1862 there was no ophthalmologic society in America, no professor or other recognized special teacher of ophthalmology in any American medical college. Specialists were regarded as charlatans, and most of them up to that time had deserved this reputation. It was no wonder that Dr. Homberger's journal, excellent as it was, did not long survive.

When the new ***American Journal of Ophthalmology*** was started in 1884, by Dr. Adolf Alt, conditions had somewhat changed. The American Ophthalmological Society had been meeting regularly for almost twenty years. Ophthalmology had been recognized in one of the sections of the American Medical Association. There were local societies devoted to it. It had a lecturer or professor in each of the better medical schools. With the help of men like John Green, William Thomson, Wadsworth, Kipp, Hotz, Buller, and others, Dr. Alt has been able to make his journal a scientific success, and to maintain it for more than one-third of a century.

But this has been accomplished only by effort and sacrifice. and the development of the journal has been hampered by lack of support. The time has now come when there are six thousand or seven thousand medical men in America who claim to pay special attention to disease of the eye. It is now as proper to combine the needs and resources of a large proportion of these ophthalmologists in the establishment of a greater American Journal of Ophthalmology, as it was for Dr. Homberger to attempt his first publication, or Dr. Alt. with the assistance of a group of friends, to make good what his predecessor had attempted.

This new undertaking is now well started. The existing journals named above have been brought together, a larger income has been pledged to the new enterprise than any ophthalmic journal has heretofore been able to command. The plans for organization of the new journal are rapidly being perfected. This is not the time to announce them. They will in due season announce themselves. But it is the time for any ophthalmologist who has thought of a way in which ophthalmic journals could be improved, to offer his suggestion. All such suggestions will be welcomed and carefully considered.

It is also the time when every ophthalmologist, who is interested in having a good journal, should give the support of his subscription. It is hoped that every subscriber to this journal will now subscribe for its successor. The price for the new journal will be ten dollars per year. This will be less than one-third of the cost of the journals that it replaces. Over one thousand subscriptions have been received at a price of fifteen dollars per year. But it is hoped that a much wider circulation can be secured at the lower price. With the cooperation of those who have previously taken the journals to be replaced, this hope will be fulfilled and the new *American Journal of Ophthalmology* will be as great an advance on its predecessors as was the publication of the original journal where no periodical of the kind had previously existed.

Clarence Loeb,
Meyer Wiener.

U.HOLZER
BINDER
BOSTON, MASS.

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